Oracle Utilities Network Management System

User's Guide

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Preface

This guide describes how to use the Oracle Utilities Network Management System. It provides instructions for completing common tasks and provides descriptions of the fields, windows, buttons, and menus you will use to perform those tasks. The instructions and descriptions in this guide are based on the default product configuration for a user with full authority to use all functionality. Because the system is highly configurable, your system may look and behave differently.

Audience

This document is intended for users of the Oracle Utilities Network Management System application.

Related Documents

In addition to this User's Guide, the Oracle Utilities Network Management System documentation library includes the following.

- *Network Management System Adapters Guide*
- *Network Management System Advanced Distribution Management System Implementation Guide*
- *Network Management System Configuration Guide*
- *Network Management System Installation Guide*
- *Network Management System Licensing Information User Manual*
- *Network Management System Operations Mobile Application Installation and Deployment Guide*
- *Network Management System Quick Install Guide*
- *Network Management System Release Notes*
- *Network Management System Security Guide*

The following guides provide additional information for use when integrating with other Oracle Utilities applications.

- *Oracle Utilities Network Management System – Mobile Workforce Management Interface Implementation Guide*
- *Oracle Utilities Network Management System – Mobile Workforce Management Interface User Guide*

All Oracle Utilities Network Management System documentation may be found at docs.oracle.com.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Resources

- Appendix A-Accessibility Features documents the accessibility features in the Oracle Utilities Network Management System product user interface.
- Appendix B-Acronyms and Appendix C-Event Status and Event Type Codes provide lists of acronyms and statuses used in Oracle Utilities Network Management System.

Chapter 1

Common Features

This chapter describes common features and functionality across the Oracle Utilities Network Management System modules (for example, Web Workspace, Configuration Assistant, and so on). It includes the following topics:

- Launching Modules and Logging In
- Understanding Common Features

Launching Modules and Logging In

Launching an Application

Depending on your system installation, Oracle Utilities Network Management System modules are typically accessed by an URL (provided by your Oracle Utilities Network Management System implementation team) or through shortcuts installed on your desktop or in your application menu (such as the Microsoft Windows **Start** menu or Linux Applications menu).

The following modules are launched individually and are accessible to users having needed permissions based on User Type (see Understanding User Types for information):

- **Configuration Assistant:** The Configuration Assistant provides a graphical view of the Oracle Utilities Network Management System configuration options and allows **Administration** users to add, edit, and store configuration changes. See **Configuration Assistant** on page 24-1 for details.
- **Model Management:** Model Management is a tool for managing changes to your system model. It is available to users with **Model Validation** permissions. See **Model Management** on page 21-1 for details.
- **Service Alerts:** Service Alert Administration is an application that sends notifications to utility personnel via e-mail or text/SMS message. It may be accessed by **Administration** user types. See **Service Alert Administration** on page 8-1 for details.
- **Storm Management:** Storm Management enables you to manipulate the event and crew information that the system will use to make its calculations. It

provides access for **Full Operations**, **View Only**, and **Administration** user types. See **Storm Management** on page 7-1 for details.

- **Web Call Entry:** Web Call Entry enables you to enter and access customer call and event information. It provides access for the **Web Call Entry** user type. See **Web Call Entry** on page 5-1 for details.
- **Web Callbacks:** Web Callbacks is used to manage callback requests for customers who called in to report an outage. It provides access for the **Full Operations** user type. See **Web Callbacks** on page 6-1 for details.
- **Web Workspace:** The Web Workspace provides the tool sets and views that are the foundation of the Oracle Utilities Network Management System user environment. The common features and platform provided by the Web Workspace provide a cohesive user experience for other Oracle Utilities Network Management System modules, such as Web Trouble Management or Web Switching Management. Depending on the NMS modules that are licensed, it provides access to the **Full Operations plus Switching**, **Full Operations**, **Trouble Maintenance**, **Crew Operations**, **Switching Request**, **View Only**, **Administration**, and **Trainer** user types. See **Web Workspace** on page 2-1 for details.

Use the installed shortcuts, if applicable, or open the URL in a web browser to launch the module. The Oracle Utilities Network Management System will begin downloading *Java* components of the module to your computer. The Login window will open.

Understanding User Types

User type determines how the environment will be displayed when you log in.

- **Administration:** provides the full complement of tools with additional tools and functions to change operational parameters.
- **Crew Operations:** provides a limited version of Web Workspace with only the tools necessary for crew administration functions.
- **Full Operations:** provides operational access to all Web Workspace tools.
- **Full Operations plus Switching:** provides operational access to all Web Workspace tools plus the Web Switching Management tools.
- **Switching Request:** provides access to the Web Switching Request environment with only the tools necessary to create switching requests.
- **Trainer:** provides access to the Web Workspace environment with all licensed modules and extra tools needed by a trainer to conduct training.
- **Trouble Maintenance:** provides a limited workspace with tools necessary for outage management functions.
- **View Only:** provides read-only access to the operational environment.
- **Flex Crew Operations:** provides only crew administration functions in the Flex Ops client.
- **Flex Full Operations:** provides access to all Flex Ops tools except for Switching.
- **Flex Full Operations plus Switching:** provides operational access to all Flex Ops client tools plus the Flex Switching features.

- **Flex Switching Request:** provides access to the Flex Ops client's Switching Request features.
- **Flex View Only:** provides read-only access to the Flex client environment.

See Appendix E - Tool to User Type Matrix for information on modules and tools available by user type.

Logging In

1. To log in, enter the following information in the Login window:

   User ID: enter the user name provided to you by your system administrator.

   Password: enter the password provided to you by your system administrator.

   Validate: click the **Validate** button to verify your login credentials.

   > **Note:** If your user name and password are not entered correctly, the system will display a *Login Error* message.

   Once you have entered your user name and password, the **Validate** button will become activated.

2. Click **Validate** (or press Enter while in the password field) to validate your credentials.
3. Select **User Type** from the drop-down list to determine what tools and functions will be available to you (some applications only allow one user type). See Understanding User Types for more information.
4. If you are logging in to Web Workspace, you have the option to select a Workspace Layout. See **Managing Your Workspace Layout** on page 2-15 for details.
5. Once the login criteria have been entered, click the **Login** button to complete the login process and open the module.

   > **Note:** If two-factor authentication is enabled, the Two Factor Authentication dialog box will open. To request an authentication code, select a delivery method from the drop-down list, and then click **Request Code**. Once you receive the code, enter it in the **Code** field, and click **OK**.

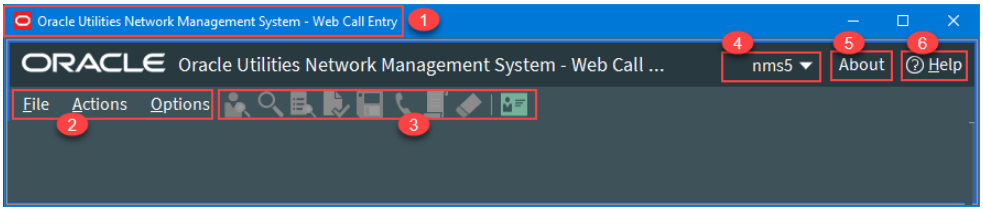
6. The **Quit** button closes the Login window and exits the Oracle Utilities Network Management System.

Understanding Common Features

There are several features that are common to nearly all Oracle Utilities Network Management System modules and tool windows.

Understanding Module Window Configuration

All NMS modules (such as Web Workspace, Web Call Entry, Storm Management, and so forth) have a general window layout with a title bar, menus, and toolbars. The menu bar provides options specific to the module, while the User menu provides options that are common to all modules.



NMS module window without any tools displayed.
Annotations:

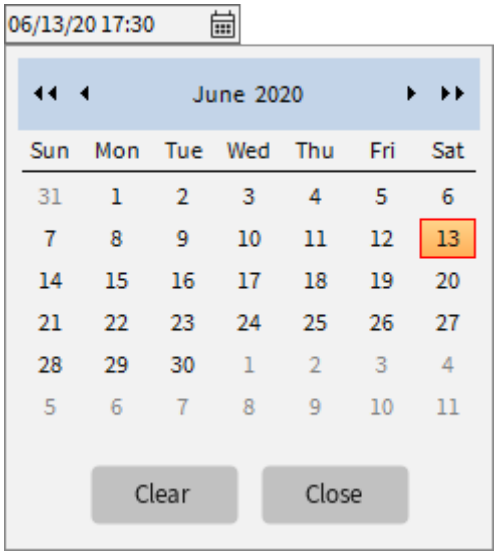
1. Title Bar	4. User Menu
2. Menu Bar	5. About Link
3. Toolbar	6. Help Link

Module Window Configuration

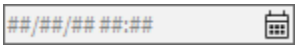
1. **Title Bars** display the name of the module, tool, or dialog box.
2. **Menu Bar** provides access to actions you may take in the module. Menu options that are followed by an ellipsis […] indicate that the option opens another window or dialog box.
3. **Toolbars** provide quick access to common functions. Toolbar buttons are used to perform an action or open a window. Button actions often correspond to **Action** menu options.
4. **User** menus provide options for setting preferences and logging out.
5. **About** link opens a dialog box with information about the module and system.
6. **Help** menus provide access to information relevant to that window, including context sensitive online help.

Using Date/Time Pickers

Date/Time Pickers allow you to select the date and time for a date/time field. If you click the **Calendar** button, the Calendar control opens to allow you to easily select the desired date. You also have the option of clicking the numbers or hash marks in the fields and editing them.



- The **Clear** button will clear any date and time in the date-time field leaving hash marks:



- The **Close** button will close the Calendar control without making any changes.

You may increase or decrease the values in the field by clicking the up and down **Nudge** buttons ( ) that are below the numbers, by using the up and down arrows on your keyboard, or by using your mouse scroll wheel.

> **Note:** Where a date or time field is configured to default to larger incremental changes, two sets of **Nudge** buttons are displayed.

The numbers will increment by a configured value; for smaller increments, press and hold the **Ctrl** key while using the mouse or keyboard or use the thinner nudge buttons.

When you use a keyboard arrow or the mouse scroll wheel, the arrow beneath the value corresponding to the arrow or scroll direction will be highlighted.

Working with Tables

Selecting and Deselecting Rows

Many tables in Oracle Utilities Network Management System applications and tools allow multiple rows to be selected for a subsequent action, such as acknowledging new events in the Work Agenda.

Selecting a Single Row

To select a row, click anywhere in the row; the row will change to the selected highlight color.

Selecting Contiguous Rows

To select contiguous rows, click the first row, press **Shift**, and then click the last row to select the anchors and all rows in between.

Selecting Noncontiguous Rows

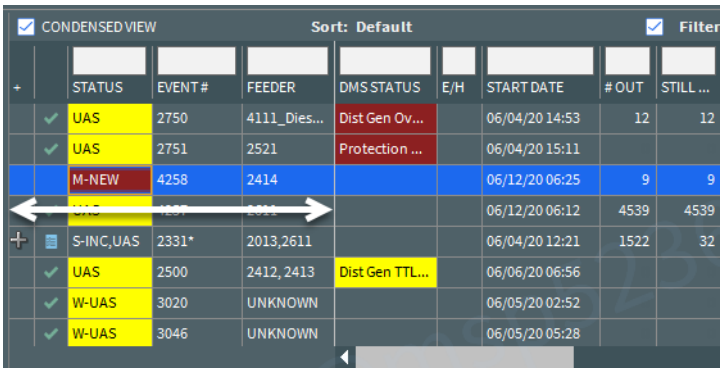
To select noncontiguous rows, select the first row, press **Ctrl**, and then click each additional row.

Deselecting Rows

To deselect a row, press **Ctrl** and then click any cell in the row. The highlight color will be removed. Note that the cell may have a highlighted border, but it is not in a selected state.

Understanding Column Display Options

Tables may have the option to hide/unhide columns and to unlock columns that are set to be shown even when scrolling to the right. For example, in the image below, the first five columns are locked, and the horizontal scroll bar starts in the next column.



Displaying Columns

Table columns can be hidden or unhidden by right-clicking the table header and selecting **Select Columns...** from the context menu. The dialog box displays all columns and you may show or hide columns by selecting or deselecting the check box, respectively.

Unlocking and Locking Columns

Locked table columns may be unlocked by right-clicking the table header and selecting **Unlock Columns** from the context menu. To lock columns, right-click the table header of the column you want to be the rightmost locked columns.

Copying Table Data

Many tables in Oracle Utilities Network Management System applications and tools allow data to be copied and pasted into other applications.

1. Select the row or rows to be copied.
2. Press **Control+C** to copy the row data.
3. In the target application, such as a spreadsheet application, press **Control+V** to paste the data.

Exporting Table Data

Many tables in Oracle Utilities Network Management System applications and tools allow data to be exported as comma separated values (csv) files. If the export option is available, it will typically be listed under the tool's File menu as **Export Table...** or the export table button ( ) may be available from a toolbar.

Understanding Table Cell Tooltips

If a table cell's content is truncated, you may hover your mouse over the cell to see the full value.

Sorting Data Tables

You can sort many Web Workspace data tables to display rows in a particular order. Some of the Web Workspace tools also allow you to create your own user-defined sorts. These options, if available, will be found in the tool's Sort menu or from an context menu when you right-click a column heading.

You can apply ascending or descending sorts to a single column in a table (where configured) by clicking once on the column header; clicking a second time on the column header will sort the rows in the opposite order. An arrow appears next to the column label identifying if the sort is ascending or descending.

Sort topics include:

- Using the Sort Dialog Box
- Creating a User-Defined Sort
- Editing and Deleting Saved Sorts

Using the Sort Dialog Box

Some Web Workspace tools allow you to create, modify, apply, and save user-defined sorts. Sorts are saved for each application, user, and user type. Thus, if a user logs in with multiple user types, each type will have their own set of sorts.

If a table supports user-defined sorts, select **Sort Dialog…** from the Sort menu or click the **Sort** button on the toolbar to display the Sort Dialog. You can also right-click the table header and then select **Sort...** from the context menu.

The Sort Dialog displays the following items:

- The **Current Sort** drop-down list presents a list of saved sorts for modification. When you select a sort from the list, the sort criteria are displayed.
- The table within the dialog box allows you to specify the order in which the sort criteria is applied, which column in the application is to be used in the sort criteria, and in which direction the sort is to be applied (ascending, descending).
- The **OK** button applies the current sort to the table of data and exits the Sort dialog box.
- The **Save...** button opens a dialog box for naming and saving the current sort. Saving automatically applies the sort. You can retrieve sorts through the option menu on the Sort Dialog and the Sort menu in the window.
- The **Delete** button opens a dialog box asking you to confirm the deletion of the selected sort. Once it is deleted, you can no longer retrieve the sort.
- The **Show** button applies the current sort settings to the table of data, but does not exit the Sort Dialog.
- The **Help...** button display help for using the Sort Dialog.
- The **Exit** button closes the Sort Dialog.

Creating a User-Defined Sort

To create a user-defined sort, complete these steps:

1. Open the Sort Dialog by selecting **Sort Dialog…** from the Sort menu or by right-clicking the table header and selecting **Sort...** from the context menu.
2. In the row for Order 1, click on the drop-down list under **Column** and select the first column you wish to sort by, and then click on the drop-down list under **Direction** and select which order you wish to sort the column by.
3. Repeat the previous step for any other columns you additionally want to sort by.
4. Click the **Save…** button. The Store the Sort? dialog box appears, prompting you to name the sort.
5. Click the **Yes** button. The Store the Sort? dialog box appears, and the name you provided now appears in the option menu of saved sorts.
6. Click the **OK** button. The Sort Dialog closes, and the sort is saved to the database.

Editing and Deleting Saved Sorts

You can use the option menu in the Sort Dialog to select a saved sort for modification. You can also delete a saved sort by selecting it from this menu and clicking on the **Delete** button.

Quick Sorting

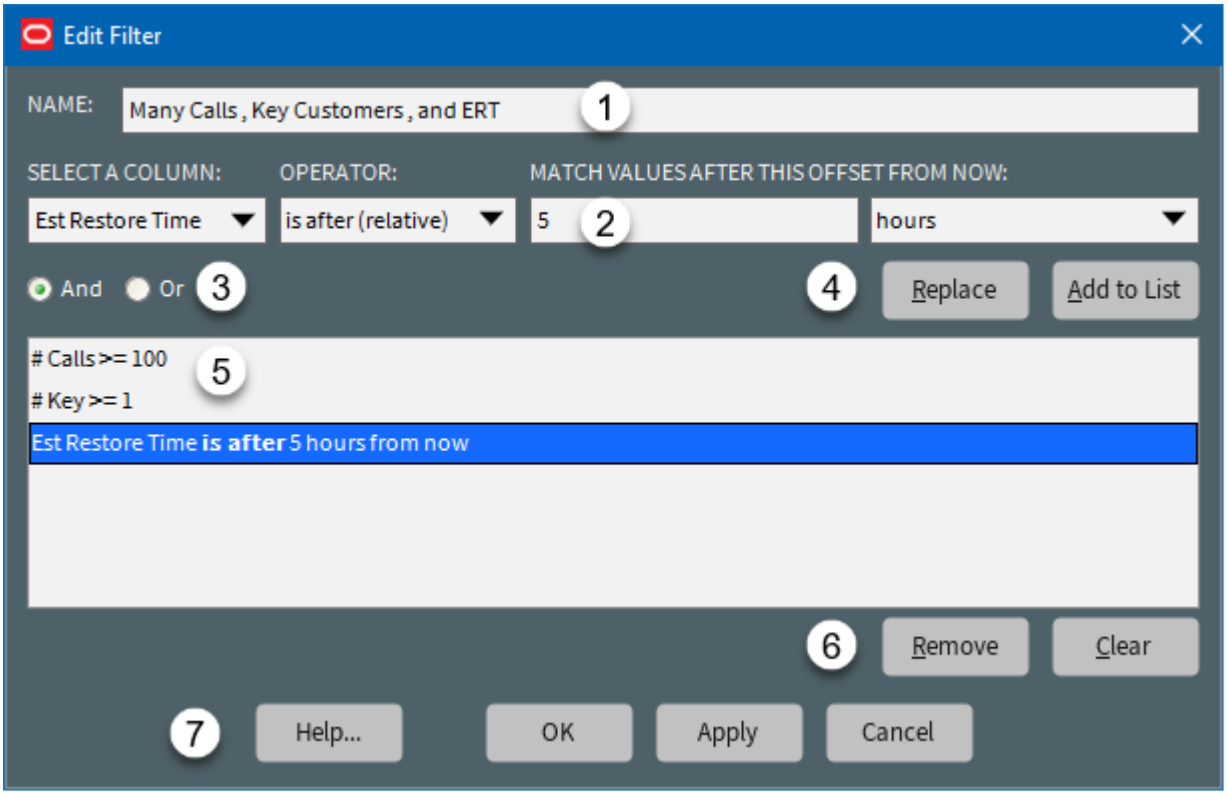
You can sort the contents of a list by clicking on a column header. An icon indicates that the column is being sorted; ascending ( ) or descending ( ) order.

Filtering Data Tables

Certain windows allow you to filter data tables using global and user-defined filters. The filters are listed in a **Filters** pane, which is typically docked on the left side of the table. The **Filters** pane has collapsible sections that list filters that you have set as **Favorites**, **Global** filters saved by your organization, **Shared** filters that have been created by users and shared, and **Personal** filters that you have created.

Creating and Editing Filters Using the Edit Filter Dialog Box

The Edit Filter dialog box allows you to create, edit, rename, and save filters.



The Edit Filter dialog box has five primary fields and panes:

1. The **Name** field.
2. The **Criterion** section provides the filtering rules and button actions.
   - **Select a Column:** A drop-down list of all of the table's columns, which allows you to select the column to filter on.
   - **Operator:** A drop-down list of filter operators that will define your data match rules. See **Understanding Operators** on page 1-13 for operator definitions.
   - **Value:** Text field that allows you to enter the value that the filter will select against.

     Note: The **Value** field changes based on the column and the operator you are using. For example, with the **Est Restore Time** column selected, you can get zero or more value fields displayed.

     - **Operator: was yesterday**. Value field is not displayed.

- **Operator: is between**. Two Date/Time fields allowing you to set the boundary conditions.
- **Operator: is before (fixed)**. One Date/Time field allowing you to select a date that the estimated restore time will be before.
- **Operator: is before (relative)**. Two data fields are displayed. The first allows you to enter a value and the second is a drop-down list with the time unit (**minutes**, **hours**, **days**, **weeks**). If you want to see all events that are estimated to be restored in the next five hours, you would enter 5 in the text field and select **hours** from the drop-down list.

See **Understanding Operators** on page 1-13 for more information about Operators.

3. **And|Or Radio Buttons** allow you to set the filter to match all criteria (**And**) or any of the criteria (**Or**).
4. **Criteria Selection Action Buttons**
   - **Replace:** When a filter criterion is selected in the **Criteria List**, the **Replace** button allows you to replace the selection with the filter criteria specified in the Criterion fields.
   - **Add to List:** Adds the filter criterion to the list of filter criteria.
5. The **Criteria List** shows the criteria that have been added to the filter.
6. The **Criteria List Action** buttons allow you to **Remove** selected criteria or **Clear** all criteria in the list.
7. The **Action** buttons allow you to save, apply, or close the dialog box without saving. You can also open online help for the dialog box.
   - **Help…:** Displays Online Help for the Filter dialog box.
   - **OK:** Applies any changes and closes the dialog box.
   - **Apply:** Applies any changes but leaves the dialog open.
   - **Cancel:** Closes the dialog without applying any changes.

Creating a User-Defined Filter

To create a filter, complete these steps:

1. In the Filter pane, right-click the folder where you want to place the filter, then select **New Filter…** from the context menu.
2. Enter a Name for the filter in the **Name** field.
3. Define a set of filter criteria in the Criterion fields. For each filter criterion, specify:
   - The column to filter.
   - The operator to use.
   - The values to match.
4. Click **Add to List**.
5. (Optional) Add more criteria, if required. You can click **Apply** at any time to see the matching results.
6. When you have finished adding the filter criteria, click **OK**.

Editing and Renaming Filters

To edit a filter, right-click the filter and select **Edit Filter…** from the context menu (or double-click the filter). In the Edit Filter dialog box, you can edit the filter criteria or rename the filter. You can also rename filters and folders by right-clicking and choosing **Rename...** or by selecting them and pressing F2.

Deleting a Filter

To delete a filter, right-click the filter and select **Delete** from the context menu.

Understanding Operators

The list of available operators is based on the type of column selected for filtering. The following table provides a description for each operator. The operators are the same for filtering and conditional formatting.

> **Note:** Text-based checks are not case sensitive; for example, 'TEST' would match TEST, Test, or test.

Operator	Type	Description
is empty (or zero)	Text, numbers	Filters or formats if the cell is empty or contains zero (0). Note that some cells have a value of zero, but the 0 character is not displayed to reduce visual clutter (for example, **#Out** in the Work Agenda).
is not empty (or zero)	Text, numbers	Filters or formats if the cell value would not match the **is empty (or zero)** operator above.
equals	Text, numbers	Filters or formats only if the cell exactly matches the filter value. Not case sensitive.
does not equal	Text, numbers	Filters or formats only if the cell value would not match the **equals** operator.
is in	Text, numbers	Filters or formats based on a set of values you specify in the filter value. If the column contains a fixed set of values, you can also choose the values from a drop-down list. Not case-sensitive.
is not in	Text, numbers	Filters or formats if the cell value would not match the **is in** operator.
contains	Text, numbers	Filters or formats where any matching text is specified in the **Value(s)** field. Not case-sensitive. **Note:** This will match parts of words; for example, 'sing' would match 'brow**sing**'.
contains one of	Text, numbers	Similar to the **contains** operator, but will filter or format if any of a list of filter values is found in the cell value.

Operator	Type	Description
like	Text	Filters or formats if the cell value matches the regular expression specified in the filter value. (Not case-sensitive) **Examples** • To find values that exactly match either X or Y, select **like** and enter `^(X|Y)$` in the filter value field (this will also match x or y, since it is not case sensitive). • To find values that start with A, select **like** and enter `^A` in the **Match Value** field. (this will also match values starting with a, since it is not case sensitive. **Note:** There are many regular expression references, including books, web sites, and tutorials. You can also find regular expression testing sites that might help when creating and testing regular expressions; remember to enable the case insensitive option of the regular expression to match the behavior of NMS filtering/formatting.
not like	Text	Filters or formats if the cell value would not match the **like** operator above.
is between	Numbers, Dates	Filters or formats if the cell value is between the specified range (including the start and end values).
is not between	Numbers, Dates	Filters or formats if the cell value would not match the **is between** operator.
is between (numeric)	Text	Filters or formats if the cell value is between the specified range (including the start and end values).
is not between (numeric)	Text	Filters or formats if the cell value would not match the **is between (numeric)** operator above.
is between (text)	Text	Filters or formats if the cell value is alphabetically between the specified range (including the start and end values, not case-sensitive). For example, is between 'a' and 'b' would match abc, or b, but not bca because bca is alphabetically after b.
is not between (text)	Text	Filters or formats if the cell value would not match the **is between (text)** operator above.
>=	Numbers	Filters or formats only if the cell value is greater than or equal to the filter value.
<=	Numbers	Filters or formats only if the cell value is less than or equal to the filter value.

Operator	Type	Description
>= (numeric)	Text	For NMS columns containing a mixture of numbers and text, this filters or formats only if the cell value is a numeric value greater than or equal to the filter value.
<= (numeric)	Text	For NMS columns containing a mixture of numbers and text, this filters or formats only if the cell value is a numeric value less than or equal to the filter value.
>= (text)	Text	Filters or formats only if the cell value is alphabetically equal to or after the filter value. Not case-sensitive. For example, bat is after ban and abc is after a.
<= (text)	Text	Filters or formats only if the cell value is alphabetically equal to or before the filter value. Not case-sensitive. For example, `ban` is before `bat` and `a` is before `abc`.
bitwise and	Numbers	This operator is used for cases where there is a single whole number value representing state in individual bits. For example, for the following binary codes: • 00000001 = suspect quality (decimal value 1) • 00000010 = stale value (decimal value 2) • 00000100 = uninitialized (decimal value 4) You could check for the stale value flag with a bit and for 00000010, which in decimals is the number 2. If you want to check for the presence of any one of a number of values, you can add them together. For example, if you want to check for suspect quality OR stale value, you could use the number 3 (1 + 2). Note that there is currently no way to check for the presence of ALL flags like this, just any one of them. That is, you cannot check for both suspect quality AND stale value being set.
bitwise not and	Numbers	Filters or formats if the cell value would not match the **bitwise and** operator above.
is empty	Date/Time	Filters or formats if the cell value is empty.
is not empty	Date/Time	Filters or formats if the cell value would not match **is empty**.

Operator	Type	Description
is in the last	Date/Time	Filters or formats if the date/time is within the last number of minutes, hours, days, and so forth from now. **Note:** Days are always checked from a midnight boundary; for example, is in the last 1 day will check from 00:00 yesterday until the current time. Week offsets are similar, but are checked from 00:00 of the first day of the week, so is in the last 1 week will match dates from the start of the previous week up until now.
is in the next	Date/Time	Filters or formats if the date/time is within the next number of minutes, hours, days, and so forth from now. **Note:** see the **is in the last operator** description for information about how day and week offsets are calculated.
is before (relative)	Date/Time	Filters or formats if the date/time is before the specified offset from **now**. **Note:** see the **is in the last** operator description for information about how day and week offsets are calculated.
is after (relative)	Date/Time	Filters or formats if the date/time is after the specified period from now. **Note:** see the **is in the last** operator description for information about how day and week offsets are calculated.
was yesterday	Date/Time	Filters or formats if the date/time was anytime yesterday.
is today	Date/Time	Filters or formats if the date/time is anytime today.
is tomorrow	Date/Time	Filters or formats if the date/time is anytime tomorrow.
was last week	Date/Time	Filters or formats if the date/time was anytime last week.
is this week	Date/Time	Filters or formats if the date/time is anytime this week.
is next week	Date/Time	Filters or formats if the date/time is anytime next week.
was last month	Date/Time	Filters or formats if the date/time was anytime last month.
is this month	Date/Time	Filters or formats if the date/time is anytime this month.
is next month	Date/Time	Filters or formats if the date/time is anytime next month.

Operator	Type	Description
is before (fixed)	Date/Time	Filters or formats if the date/time is before the specified fixed date/time.
is after (fixed)	Date/Time	Filters or formats if the date/time is after the specified fixed date/time.
is between	Date/Time	Filters or formats if the date/time is between the specified dates.
is not between	Date/Time	Filters or formats if the date/time is outside the specified dates.

Dynamic Filtering

Some tables provide a row of blank filter boxes above the column headers. Enter all or part of the text you want to filter by in the appropriate filter box. The table data is dynamically filtered to display items that contain matching values as you enter the filter criteria. You can combine filter criteria by typing values in more than one column.

Auto Filtering

Some tables support auto filtering (also referred to as cell filtering), which allows you to filter the list by the value of any cell. To use auto filtering, right-click a cell containing the value you want to filter, and select the Toggle Auto Filter option. (When enabled, the menu option is checked.) The table is refreshed to display only rows where the value matches the selected cell. For example, if you click a cell in the Feeder column with a value of "2413" and enable auto filter, the table will refresh to display only events for Feeder 2413. Click the option again to turn off cell filtering.

Organizing Filters and Folders

Filters are organized into main structures – Global, Personal, and Shared:

- Global filters are seen by all Users, but the ability to edit within this structure is based on role.
- Personal filters are seen only by the User that created them.
- Shared filters are seen by all Users. Filters placed here can be copied by Users to other structures, depending on their role.

In addition, commonly accessed filters can be added to a Favorites structure, as a shortcut.

Each top-level structure also supports collapsible folders into which filters can be placed, to help organize work and other information.

Showing, Hiding, and Revealing the Filters Pane

- Change the width of the Filters pane by dragging the vertical divider to the desired width.
- Minimize the Filters pane to a narrow sidebar by clicking the Minimize icon
- Restore it by clicking the icon again.
- When the Filter pane is minimized, mouse over the sidebar to reveal the Filters pane and choose a new filter.

Your preferred layout for each Filters pane will be stored when you save your preferences.

Creating Folders and Sub Folders

Depending on your role, you can create folders within the **Global**, **Shared**, or **Personal** structures. Folders can be used to organize filters into hierarchic structures.

1. To create a folder, right-click a filter structure and choose **New Folder…**.
2. Enter a name. The folder is created.

You can also create folders inside other folders.

Folders and top-level structures can be collapsed or expanded by clicking on the icon. Once the folder has been created you can add, move, or copy filters to it.

Moving and Copying Filters and Folders

Filters are organized in folders. They can be copied or moved using drag and drop, or via items on the right-click menu.

Moving and Copying Filters

- To move a filter to a different folder, select the filter, right-click, select **Cut**, and then **Paste** in the desired location.
- To create a copy of a filter and place it in a different folder, right-click, select **Copy** and then **Paste** in the desired location.
- To create a duplicate of a filter, right click and select **Duplicate**. Enter a new name, optionally change the filter criteria, and then click **OK**.

- To delete a filter, right-click and select **Delete**.

Moving, Copying, & Deleting Folders

- To move a folder (and its contents) to a different folder, right-click, select **Cut** from the context menu, and then **Paste** in the desired location.
- To copy a folder (and its contents) to a different folder, right-click, select **Copy**, and then **Paste** in the desired location.
- To delete a folder (and its contents), right-click and select **Delete**.

Favorite Filters

If you have filters you access frequently, you can add them to the **Favorites** structure.

- Right-click a filter and select **Add to Favorites** or drag the filter to the **Favorites** structure. The filter is added as a shortcut to the **Favorites** structure.
- To remove a favorite shortcut, right-click and select **Remove from Favorites**.

  Note: The source filter is not affected by **Remove from Favorites**.
- To find a Favorite's source filter, right click the shortcut and choose **Find Target Filter**. The source filter is displayed and highlighted.

  Note: If the source filter name is edited, the shortcut in the Favorites pane updates with the new name.

Understanding Printing in Oracle Utilities Network Management System

Printing is an option in many windows. The Print Preview dialog box appears whenever one of the printing options is selected in Web Workspace or Web Trouble. The following table describes the buttons on the Print Preview dialog box.

Button	Description
	Used to preview the previous page in a multi-page output.
	Used to preview the next page in a multi-page output.
	Used to zoom out on the contents of the preview.
	Used to zoom in on the contents of the preview.
	Used to scale out the font used for the print output.
	Used to scale in the font used for the print output.
	Toggles the page orientation of the output between portrait and landscape.
	Brings up the Page Setup dialog box, which allows you to select paper size and source, set page orientation, set margins, and select the printer.
	Reverts the preview window back to its default settings.
	Sends the print output to your selected printer, and then closes the Print Preview dialog box.
Close	Closes the Print Preview dialog box without printing any output.

Setting Print Margins

The Print Preview dialog box also allows you to set the margins of the output interactively. Follow these steps:

1. Position your cursor over the preview output until you see a red outline and your cursor becomes a double-headed arrow.
2. While the cursor is a double-headed arrow, click and hold your left mouse button and drag the red line to the desired location.

Chapter 2

Web Workspace

This chapter describes the Oracle Utilities Network Management System Web Workspace application. It includes the following topics:

- Getting Started with Web Workspace
- Using the Work Agenda
- Using the Viewer
- Using the Control Tool
- Condition Summaries
- Using the Alarm Displays
- Using the User Log

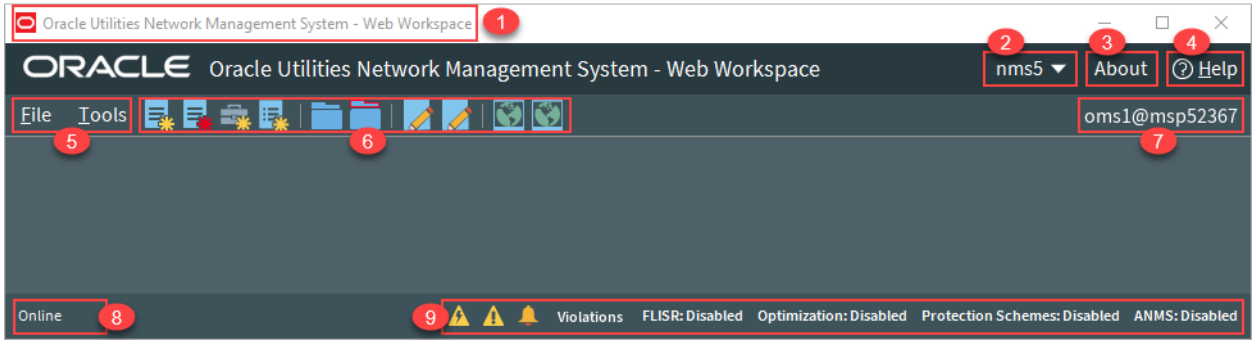
Getting Started with Web Workspace

The Web Workspace is a real-time application that provides the tool sets and views that are the foundation of the Oracle Utilities Network Management System user environment. The common features and platform provided by the Web Workspace provide a cohesive user experience for Oracle Utilities Network Management System modules. This section provides information on common Web Workspace features, including the following topics:

- Understanding the Web Workspace Window
  - Understanding the Web Workspace Menus and Toolbar
  - Understanding Annunciators
- Understanding Windows, Frames, and Dock Panes
  - Adjusting Window Size
  - Adjusting Window Size
- Taking Authority for Control Zones
- Taking Authority for Control Zones
- Creating an Event

Understanding the Web Workspace Window

Web Workspace features and functionality are accessed through menus and toolbar buttons. A particular configuration of a user type's environment determines whether a tool is displayed as a window when you first log in to the system.



Web Workspace without any tools displayed.
Annotations:

1. Title Bar	6. Toolbar
2. User Menu	7. Environment Information
3. About Link	8. System Status Indicator
4. Help Link	9. Annunciators
5. File and Tools Menus	

The Web Workspace window contain the following components:

- **Title Bars** display the name of the tool or dialog box.
- **Menus** provide access to tools and user actions in the Web Workspace. See
- **Annunciators** (or indicators) provide visual cues to system state or something that needs your attention.

Understanding the Web Workspace Menus and Toolbar

This section describes the menu and toolbar options. In the tables below, each menu item is listed along with submenu options, if available, and the default toolbar icon, if applicable; menu items without a default toolbar icon are indicated with a double dash(--) in the toolbar icon cell.

> **Note**: Menu and toolbar options vary depending on your user type, your system configuration, and licensed products.

File Menu

Menu Option	Submenu Option	Description	Toolbar Icon
New	**Switching Sheet...**	Opens the **New Switching Sheet** tool that allows you to create a new switching sheet based on switching event type (for example, planned or emergency).	
	Safety Document...	Opens the **New Safety Document** tool that allows you to create a new safety document from a set of predefined types.	
	Event...	Opens the **Create Event** tool that allows you to create a new outage, new stable outage, non-outage, or restored real outage event.	
	Damage Assessment...	Opens a new **Damage Assessment** document window. See **Creating Fuzzy Damage Assessments** on page 3-56 for information.	
Open	**Switching Sheet...**	Allows you to open a switching sheet.	
	Switching Sheet Search...	Allows you to search for a switching sheet. By default, the search field searches against the switching sheet number and description fields. See **Open Switching Sheet using Switching Sheet Search** on page 11-84.	--
	Safety Document...	Allows you to open a safety document.	
	Safety Document Search...	Allows you to search for a safety document. By default, the search field searches against the safety document number and description fields. See **From the Web Workspace Search Safety Document Dialog** on page 11-121.	--

Tools Menu

Menu Option	Submenu Option	Description	Toolbar Icon
Work Agenda 1...		Opens the Work Agenda. See **Using the Work Agenda** on page 2-30.	
Work Agenda 2...		Opens a second Work Agenda.	
Viewer 1...		Opens the Viewer. See **Using the Viewer** on page 2-45.	
Viewer 2...		Opens a second Viewer.	
Authority...		Opens the Authority tool, which grants control authority to users subscribing to discrete operations zones. See **Taking Authority for Control Zones** on page 2-24.	--
Crews...		Opens the Crew Actions tool, which shows the crews available in the subscribed control zone. See **Using Crew Actions** on page 4-1.	--
User Log...		Opens the User Log, which displays a list of all single-user actions within a certain time period. See **Using the User Log** on page 2-144.	
Manage Documents...		Opens the Manage Documents window, which allows you to associate documents to objects. See **Associating Documents with Devices** on page 2-131.	
Topology Validation Viewer...		Opens the Topology Validation Viewer, which displays reports of a number of different common problem areas with a data model, such as de-energized supply points, loops, and faulted areas. See **Topology Validation Viewer** on page 22-1 for more information.	--
Switching Overlaps...		Opens the Global Overlaps tool. See **Viewing Global Overlaps** on page 11-128.	
Miscellaneous Log...		Opens the Miscellaneous Log. See **Using the Miscellaneous Log** on page 11-126.	
Trouble Summary...		Opens the Trouble Summary. See **Using the Trouble Summary** on page 3-62.	--

Menu Option	Submenu Option	Description	Toolbar Icon
Condition Summaries...		Opens the Condition Summaries. Predefined filters include: • All Conditions • FLISR Actions • FLISR Disabled • Notes • Pending Construction • Pending Decommission • Tags See **Condition Summaries** on page 2-134 for details.	
SCADA Summary...		Displays the SCADA Summary. See **Using the SCADA Summary** on page 10-17 for more information.	--
SCADA Status...		Displays the SCADA Status window.	--
Alarms Displays	**Alarms...**	Display all current alarms in the subscribed authority zones. See **Understanding the Alarms List** on page 2-138	--
	Abnormal Alarms...	Display a list of off-nominal devices in the subscribed authority zones. See **Understanding the Abnormal Devices List** on page 2-142.	--
	Alarm History	Display the alarm history for the subscribed authority zones See **Understanding the Alarm History List** on page 2-143.	--
AMI Request List...		Opens the AMI Request List. See **Displaying the AMI Requests List** on page 3-57.	--
DMS Summary...		Opens the DMS Summary tool to view the status of distribution management system (DMS) functions and devices. See **Using the DMS Summary** on page 17-37.	
Feeder Load Summary...		Opens the Feeder Load Summary, which displays a list of the current feeder loads. See **Using the Feeder Load Summary** on page 17-4.	--
Suggested Switching Solutions...		Opens the SS Solutions tool. See **Using the Suggested Switching Solutions Tool** on page 13-10.	

Menu Option	Submenu Option	Description	Toolbar Icon
Load Shed and Restoration...		Opens the Load Shed and Restoration tool. See **Understanding the Load Shed and Restoration Tool** on page 15-2. **Note:** By default, this option is only available for **Administration** and **Trainer** user types.	
DERMS Dashboard...		Opens the DERMS Dashboard, which provides information related to distributed energy resources (DERs) connected to an electric distribution system. See Chapter 16, DERMS Dashboard, for information.	
Conductor Impedance Mismatch Tool...		Opens the Conductor Impedance Mismatch tool, which performs an analysis to locate conductor data anomalies within the Power Flow Data Model and displays the report. See **Using the Conductor Impedance Mismatch Tool** on page 12-20 for information.	
FLM Islands Statistics...		Opens the FLM Islands Statistics tool. See **Using the FLM Island Statistics Window** on page 17-38. **Note:** By default, this option is only available for **Administration** and **Trainer** user types.	
Protection Scheme Analysis...		Opens the Protection Scheme Background Check dialog box, which allows you to start a protection scheme background check. See **Dynamic Protection Schemes** on page 23-1 for information.	

Menu Option	Submenu Option	Description	Toolbar Icon
DMS Settings	**FLISR Mode** **Disabled** **Manual** **Automatic**	Allows you to set the Fault Location, Isolation, and Service Restoration (FLISR) mode. See **Setting the System FLISR Mode** on page 18-6.	
	FLA Mode • **Disabled** • **Sustained** • **Momentary and Sustained**	Allows Administrators to set the global FLA mode. • **Disabled:** FLA is disabled for all feeders. • **Sustained:** FLA is enabled for sustained faults only. • **Momentary and Sustained:** FLA is enabled for both momentary and sustained faults. **Note:** The FLA behavior depends on the FLA configuration for that feeder and the FLA mode. See **Global FLA Versus Individual Feeder FLA Configuration** on page 19-10 for more information.	
	Optimization Mode • **Disabled** • **Manual** • **Automatic**	Allows you to set the Optimization mode. See **Setting the Optimization Mode** on page 14-5.	
	Protection Schemes • **Disabled** • **Manual** • **Automatic**	Allows you to set the Protection Scheme global mode.	
	FLM Status • **Disabled** • **Enabled**	Allows Administrators to set the Feeder Load Management status. See **Feeder Load Management Overview** on page 17-1. • **Disabled**: FLM forecasts have been disabled, usually due to a model build. Only real-time information will be displayed. • **Enabled**: FLM forecasts are currently enabled.	
	ANMS Status • **Disabled** • **Manual** • **Automatic**	Allows Administrators to set the Active Network Management Schemes (ANMS) global mode. See **Understanding ANMS Modes** on page 20-2 for more information. **Note:** you must be logged in as an Administrative user to see this option.	

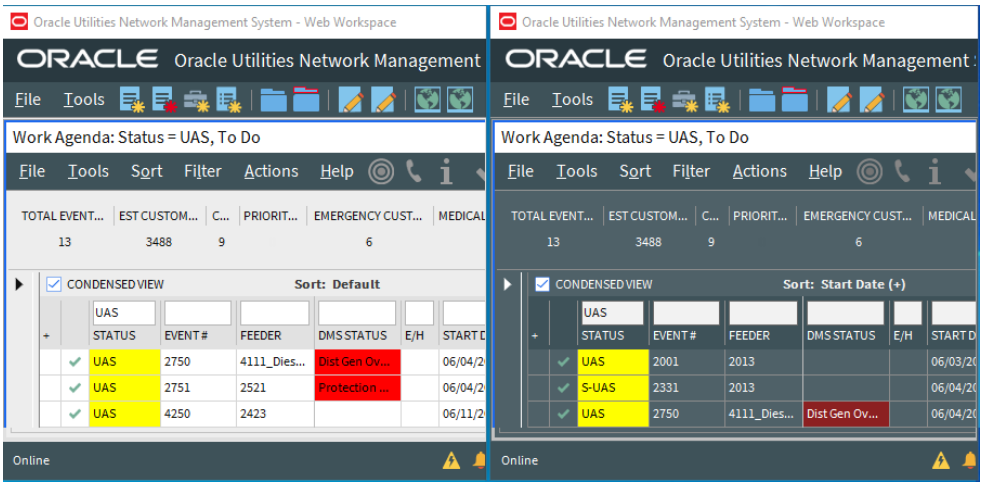
Understanding the Web Workspace User Menu

The **User Menu** provides submenus with options to change the appearance and functionality of user interface elements, transfer control of the session to another user, and log out of the Web Workspace.

Understanding the User Interface Settings Menu

The **User Interface Settings** submenu allows you to set how Web Workspace windows appear to you.

- **Theme Selection Radio Buttons:** The theme selection allows you to choose whether the Web Workspace uses the **Dark Theme** or **Light Theme**.
  - The **Dark Theme** is generally better for low-lit conditions.
  - The **Light Theme** is generally better for well-lit conditions.



Note: Unlike other user preferences, your Theme selection is saved to your workstation user settings since they are more likely influenced by the light in a location. See **Understanding the Manage Preferences Menu** on page 2-9 for information about saving other preferences to the database.

- **Capitalize Field Labels:** If selected, field labels will be displayed in All Caps (for example, **NAME**). If not selected, field labels will be displayed in title case (for example, **Name**).
- **Toggle Accessible Mode:** Changes settings to enable use with screen readers. Note: There are prerequisites to enabling accessible mode. Please see Appendix A-Accessibility Features for information on enabling **Accessible** mode.
- **Show Messages at Mouse Location:** Sets the system to display popup confirmation and warning dialog boxes at your mouse pointer position.

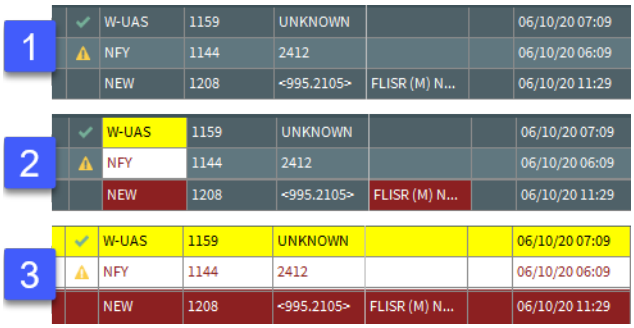
  Note: This can be very useful when using multi-monitor configurations so you don't have to search for confirmation messages and dialog boxes across multiple screens.
- **Audio Enabled:** Allows you to turn audible alarms on or off.
- **Smaller Font:** Decreases the font size in text and icons. Repeat to further decrease the font size.

- **Bigger Font:** Increases the font size in text and icons. Repeat to further increase the font size.
- **Reset Font:** The application will reset the text and icons to use their default font size.
- **Darken Watermarks:** Make the watermarks more opaque.
- **Lighten Watermarks:** Make the watermarks more transparent.
- **Show Watermarks:** Allows you to toggle watermarks on or off.

Understanding the Table Settings Menu

The Table Settings submenu allows you to configure how tables will appear.

- **Alternate Row Coloring:** When selected, displays data table rows in alternating colors.
- **Capitalize Column Headings:** allows you to select whether column labels should be displayed in all capital letters (for example, **STATUS**) or in title case (for example, **Status**).
- **Table Color Formatting Mode:** Determines whether and how tables will display background coloring.



1. **None:** Tables will not contain color indicators for statuses.
2. **Cells:** Table cells will contain background colors based on the cell statuses.
3. **Row:** All cells in a table row will have the background color.

- **Table Font Formatting Mode:** Determines whether and how tables will display font formatting.
  - **None:** Conditional formatting related to font formatting are never shown
  - **Cells:** Conditional formatting related to font formatting are applied only to the cells they were configured for.
  - **Row:** Conditional formatting related to font formatting are applied across the whole row. Where more than one formatting rule is applied, the highest priority rule is displayed.

Understanding the Manage Preferences Menu

- **Manage Workspace Layouts...:** Opens the Manage Workspace Layouts dialog box, which allows you to save, rename, update, or delete Workspace Layouts. See **Managing Your Workspace Layout** on page 2-15 for details.

- **Save Preferences:** Saves your preferences to the database so your settings are available wherever you log in. See **Saving Your Preferences** on page 2-15 for more information.

Note: Theme selection is saved to your user settings on the workstation since they are more likely influenced by the light in a location. See **Understanding the User Interface Settings Menu** on page 2-8 for information.

- **Restore Preferences:** Opens a dialog box that allows you to select the preferences to restore. See **Saving and Restoring Workspace Preferences** on page 2-14.
- **Manage Site-wide Settings:**
  - **Update Site-wide Default Layout:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the window layout preferences for all users of the log in type.
  - **Restore Site-wide Default Layout:** Returns the client to the default window positioning, sizing
  - **Update Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the default preferences for all users of the log in type.
  - **Restore Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may restore the default preferences for the logged in user type to the original configuration. See **Saving and Restoring Workspace Preferences** on page 2-14 for more information.

- **Transfer...:** Logs you out of the system without shutting down the client so another user may log in.
- **User Logout:** Logs you out of the system and shuts down the client.

Help Menu

Menu Option	Description
Web Workspace Help	Launches the online help system and loads the Web Workspace content.
Calculate Network Latency...	Runs a network diagnostic utility and returns the results in the **Network connectivity results** window.
Email Log Files...	Gathers the environment's log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Web Workspace	Opens a window with environment and software information.

Understanding Annunciators

Annunciators, located in the bottom right corner of the Web Workspace window, are a combination of symbolic and text-based notifications of system statuses. In the base environment, annunciator alerts are displayed for the statuses listed below.

- **Unacknowledged Outage Events** ( ). See **Acknowledging Events** on page 2-44 for details on responding to new events.
- **Unacknowledged Non-Outage Events** ( ). See **Acknowledging Events** on page 2-44 for details on responding to new events.
- **Unacknowledged System or Crew Emergency Alarms** ( ). See **Using the Alarm Displays** on page 2-138 for information on viewing and acknowledging system alarms.
- **Quarantines.** The Quarantine alert is displayed when there are quarantined areas. Click the **Quarantine** annunciator button to display the Quarantine conditions in the Condition Summaries tool. For information on Quarantines, see the following:
  - The Viewer's **Options** menu allows you to set the Quarantine condition on a selected feeder. See **Assessment...** on page 2-103 for information on **Viewer** interactions.
  - The Control Tool's Assessment... option allows you to set the Quarantine work queue from the Assessment... context menu. See **Assessment...** on page 2-103 for information.
  - The Condition Summaries **Filter** menu allows you to show only Quarantine conditions. See Condition Summaries **Actions Menu** on page 2-136.
- **Violations.** The Violations alert is displayed when there are devices or feeders in a violation or warning state. Click **Violations** to open the Feeder Load Summary window in Present Load view. See **Using the Feeder Load Summary** on page 17-4 for information.
- **FLISR Mode Status**. *FLISR mode* is displayed when FLISR is set to *Manual* or *Automatic*. See **DMS Settings** on page 2-7 and **Fault Location, Isolation, and Service Restoration** on page 18-1 for more details on using FLISR.
- **Optimization Mode Status.** See **Setting the Optimization Mode** on page 14-5.

  Notes:
  - Setting FLISR Mode and/or Optimization Mode determines the system-wide behavior, which may override the feeder level configuration, which is set using the Configuration Assistant. The following rules apply.
    - If the system or feeder is disabled, then Optimization/FLISR is disabled, next
    - If the system or feeder is manual, then Optimization/FLISR is manual, next
    - If the system and feeder are automatic, then Optimization/FLISR is automatic

- **ANMS Mode Status.** Global ANMS mode is displayed. See the DMS Settings menu's description of **ANMS Status** on page 2-7 for more information and the ANMS chapter's Global ANMS mode section.

  Note: Additional annunciators may be added on a per implementation basis.

Understanding Windows, Frames, and Dock Panes

Some Web Workspace tools display as dock panes within the Web Workspace, and others display as standalone windows. Dock panes may be moved within the Web Workspace, dragged out of the Web Workspace window where they may float or be docked in a window frame (see **Creating Window Frames** on page 2-12).

Web Workspace tool windows may be moved and sized in many ways. Initially, window positioning is determined by the product or project configuration, but you may move and size windows to support your workflow and preferences. You can save your window configuration for future sessions by using Manage Workspace Layouts (see **Managing Your Workspace Layout** on page 2-15 for information).

Creating Window Frames

A frame is a user-defined container that can be used to organize Web Workspace tools. The frame (and the tools that you place within it) can then be stored as part of a Workspace Layout (see **Managing Your Workspace Layout** on page 2-15 for information).

To create a frame:

1. From the Web Workspace **File** menu, select **New Frame…** to open the New Frame dialog box.
2. In the Frame Name field, enter a name for the frame.
3. Add dock pane tools to the frame, as described in **Understanding Dock Panes** on page 2-13.
4. Create other frames, as required.

   Notes:

   - Once a frame has been created, its name is displayed at the bottom of the Web Workspace **Tools** menu. If you close a frame you can redisplay it from this menu.
   - Any frames that you have configured are stored when you save your Workspace Layouts (see **Managing Your Workspace Layout** on page 2-15 for information).

Understanding Docked Panes and Standalone Window Tools

Understanding Dock Panes

Dock panes can be arranged within the Web Workspace, added to frames, or allowed to float outside of windows.

Use a dock pane's title bar or right-click menu options to re-arrange it:

- To separate a dock pane from its parent container, click and hold the title bar and drag it out.
- To re-attach it, right-click the title bar and deselect **Floating** from the options menu.

When the Web Workspace or a frame already contains a dock pane tool, you can arrange other dock pane tools in it:

- To place a dock pane alongside (tile) another dock pane, click and hold the floating panel title bar, then drag it toward the edge, top, or bottom of the docked tool, until an outline appears, then release the mouse button. Repeat as necessary.
- To maximize a tiled dock panel, double-click on its title bar. To restore it, double-click again.
- To minimize a tiled dock panel, right-click on its title bar then select **Autohide**. Mouse over the minimized tab to reveal the dock panel.
- To arrange dock panels in tabs, click and hold the floating panel title bar, then drag it over the title bar of the docked tool, until an outline appears, then release the mouse button. Repeat as necessary.

Understanding Standalone Windows

Standalone windows differ from dock panels in that they can be minimized and maximized.

You can toggle tools to behave as standalone windows or as dock panels. To turn a dock panel tool into a Standalone Window, from the dock panel tool's **File** menu, select **Toggle Dockable Window**. Note that the window has a thicker title bar that allows you to maximize and minimize the window.

To toggle a Standalone Window into a dock panel:

1. From the tool's **File** menu, select **Toggle Dockable Window**. Upon doing this, note that the tool now displays as dock panel inside the standalone window.
2. Drag the dock panel title bar to another container. When placed in the new container the standalone window disappears.

Adjusting Window Size

Windows and dock panel can be resized by dragging the corners or edges to the desired width or height.

Switching Between Tools Using the Keyboard

You can switch between open tools by pressing **Ctrl+Tab**, which will display a list of open applications. The list is ordered so the most recently used tools are at the top. You can cycle through the applications by continuing to hold the **Ctrl** key and pressing **Tab** until the tool you wish to switch to is highlighted; the highlighted tool will become active when you release the **Ctrl** key. You can go backwards in the list by pressing **Ctrl+Shift+Tab**. You can also hold the **Tab** key to quickly cycle through the entries in the list, which may be useful when you have many tools open.

Saving and Restoring Workspace Preferences

Web Workspace starts with a standard configuration for window locations and sizes, font sizes, visible tools, and tool settings, such as column size and order. You can make adjustment to the workspace and then save those changes for future sessions.

Preferences are saved for the following features:

General

Accessible Mode selection

Windows

The currently open windows are saved and reopened when you login. This feature is restricted to the following windows:

- Condition Summary
- Crew Actions
- Viewers (each Viewer is saved separately)
- Service Alarms
- SCADA Summary
- Work Agendas (each Work Agenda is saved separately)
- FLM Summary

Table Attributes

- Column widths
- Column ordering
- Locked columns
- Current sort
- Current filter

Viewer Settings

- Unload on Focus
- Fixed Size
- Search Type
- Search Case
- Search Max Results
- Spatial Landbase
- Declutter
- Predicted Highlight Enable
- Conductor State Highlight
- Warnings Highlight
- Violations Highlight

Filters

- Size and collapsed state of the Filter side panes
- Filter folder collapsed/ expanded state
- Selected filter

Note: Ensure that only one switch plan is displayed when you save preferences (the system will not allow preferences to be saved if multiple sheets are open). The preferences for that sheet will be applied to all sheet types to the extent possible.

Saving Your Preferences

When you have your environment set up the way you want (for example, larger font size and table column selection), select **Save Preferences** from the **User** menu's **Manage Preferences** submenu.

Restoring to Default Preferences

To restore to the default environment settings, select **Restore Preferences** from the **User** menu's **Manage Preferences** submenu, which will open a dialog box with a list of user preference categories that may be restored:

- **Table Sort Definitions**
- **Table Layouts**
- **Font Size**
- **All Other Preferences**

Select the categories that you want to restore and click **OK**. The restored environment settings will take effect when you next log in.

If you have Administration permissions (having access to the Configuration Assistant), you can use the **Restore Site-wide Preferences** option in the **Manage Preferences** submenu to restore preferences for all users of the user type that you logged in as (for example, Full Operations).

Managing Your Workspace Layout

You can save and reload the layout of NMS tools as a *Workspace Layout*. Each Workspace Layout stores the size and position of your open windows and frames (see **Creating Window Frames** on page 2-12 for information on Frames).

You can save multiple workspace layouts. This is useful when logging in at desks with different screen configurations. When you log in to Web Workspace, you have the option of choosing a workspace layout to load.

Understanding the Manage Workspace Layouts Dialog Box

The Manage Workspace Layouts window allows you to create and manage your workspace layouts.

Understanding the Layout Name Pane

The Layout Name pane lists any workspace layouts associated with your user name.

Understanding Button Actions

- **Help:** Launches online help for the Manage Workspace Layouts topic.
- **New:** Enables you to create a new workspace layout.
- **Rename:** Allows you to rename the selected workspace layout.
- **Update:** Updates (overwrites) the selected workspace layout with the current window and frame layout.
- **Delete:** Deletes the selected workspace layout.

Working with Workspace Layouts

The following procedures describe how to manage workspace layouts.

Adding a New Workspace Layout

1. Arrange your windows and frames as desired.
2. From the Web Workspace **User** menu, select **Manage Preferences**, then **Manage Workspace Layouts**. The Manage Workspace Layouts window is displayed.
3. Click **New** to open the New Workspace dialog box. Enter a name in the **Workspace Name** field and then click **OK**.

   Note: Click **Cancel** to close the dialog box without creating a new layout.
4. Click **Close** to close the Manage Workspace Layouts window.

Loading a Workspace Layout

1. Begin a new Web Workspace session. At the Login screen, after validating your **User ID** and **Password** and then selecting your **User Type**, if applicable, select the **Workspace Layout** that best suits your monitors and work flow.
2. Click the **Login** button. The windows and frames (if applicable) are then displayed in the same configuration as when you saved the workspace layout.

Renaming a Workspace Layout

1. From the Web Workspace **User** menu, select **Manage Preferences**, and then select **Manage Workspace Layouts**.
2. In the Manage Workspace Layouts' **Layout Name** pane, select the workspace that you want to rename.
3. Click **Rename** and then enter the new name in the **Workspace Name** field.
4. Click **OK**. The Layout Name pane will update with the renamed layout

Updating a Workspace Layout

You have the ability to modify a layout by changing your working environment and then updating the previously created layout with the new configuration.

1. Arrange your windows and frames as desired.
2. From the Web Workspace **User** menu, select **Manage Preferences**, and then select **Manage Workspace Layouts**. The Manage Workspace Layouts window is displayed.
3. In the Layout Name pane, select the workspace that you want to update.
4. Click **Update**. The new layout is saved as the selected Workspace Layout name.
5. The Workspace Layout Saved dialog box will notify you that the workspace layout has been saved. Click **OK** to dismiss the dialog box.

Deleting a Workspace Layout

1. From the Web Workspace **User** menu, select **Manage Preferences**, and then select Manage Workspace Layouts.
2. In the **Layout Name** pane, select the workspace that you want to delete.

3. Click **Delete**. The Delete Workspace dialog box will open for you to confirm that you want to delete the workspace layout.
4. Click **OK** to delete the workspace layout; if you do not want to delete the workspace layout, click **Cancel**.

Understanding Conditional Formatting

Conditional formatting can be applied to every data grid in NMS, making it a powerful way of configuring the system to draw your attention to important changes of state in the system.

> **Note:** Conditional formatting can be applied to tables by suitably authorized users.

Global and Personal Conditional Formatting

NMS supports Global and Personal Conditional Formatting.

- Global conditional formatting is applied to all users of the system. Users see the formatting the next time they log in. Global conditional formatting rules are usually applied by Administrators.
- Personal conditional formatting takes precedence over any global formatting. Only user types with the appropriate roles can apply personal conditional formatting.

The order of global and personal formatting rules are applied is defined in Conditional Formatting Precedence Rules.

Applying Conditional Formatting to a Table

To apply conditional formatting to a table, right-click any column heading, and then select either **Edit Global Conditional Formatting** or **Edit Personal Conditional Formatting**.

Adding a conditional formatting rule requires you to add a rule and then configure the formatting for the rule. These tasks are accomplished using the Conditional Formatting Dialog and the Edit Rule Dialog.

Conditional Formatting Dialog

The Conditional Formatting dialog box allows you to add and manage the conditional formatting rules associated with a table:

The fields and buttons are described below:

- **List of Rules:** Displays a list of the formatting rules applied to the table. Each rule displays:
  - **Rule Name:** The name of the rule.
  - **Row:** A check box that indicates if the rule is configured to format the row (selected) or just the cell (deselected).
  - **Conditions:** The conditions that must be met if the formatting is to be applied. Defining the conditions is equivalent to creating a filter; see **Creating and Editing Filters Using the Edit Filter Dialog Box** on page 1-11 for more information.
  - **Column:** The name of the column(s) to highlight with the formatting.
  - **Format:** The formatting associated with the rule

Note that the position of the rule in the list determines its precedence. See **Understanding Conditional Formatting Precedence Rules** on page 2-21 for details.

- Actions that can be performed on each rule:
  - **Move Up:** Moves the selected rule up the list.
  - **Move Down:** Moves the selected rule down the list.
  - **Edit:** Displays the Edit Rule Dialog, which allows you to specify the formatting rule. (You can also double-click the rule to open it for editing.)
  - **Remove:** Removes the selected rule.
  - **Duplicate:** Creates a copy of the rule and allows you to edit it.
  - **Insert:** Inserts a new rule above the selected rule and allows you to edit it.
  - **Add:** appends a new rule to the bottom of the list and allows you to edit it.
- Actions that can be applied to the dialog:
  - **Help…:** Displays Help for the Conditional Formatting dialog
  - **OK:** Applies any changes and closes the dialog.
  - **Apply:** Applies any changes but leaves the dialog open.
  - **Cancel:** Closes the dialog without applying any changes.

Understanding the Edit Rule Dialog Box

The Edit Rule dialog box allows you to configure a conditional formatting rule. Configuring a conditional formatting rule is a 3-step process:

1. Enter a name in the **Name** field.
2. On the **Conditions** tab, define the conditions (filters).
3. On the **Formatting** tab, specify the formatting to apply when the condition(s) are met.

Each of the fields and buttons in the Edit Rule Dialog is described below:

Using the Conditions Tab

The **Conditions** tab allows you to define the filter criteria to be met for the formatting rule to be applied. See **Creating and Editing Filters Using the Edit Filter Dialog Box** on page 1-11 for more information on filters.

Using the Formatting Tab

The **Formatting** tab allows you to specify the type of formatting to be displayed if the conditions are met.

Fields and Buttons

- **Format Full Row:** Specifies whether this rule will apply to the whole row of the table when font or color conditional formatting modes are set to **Row**.
- **Format Columns:** Allows you to select the column(s) to apply the formatting to.

  Note: If no columns are chosen, then the formatting will apply to the first column of the table when the conditional formatting modes are set to **Cells**.

- **Check Boxes:** The check boxes to the left of the following fields control whether a particular field is enabled for the rule. These are automatically enabled when a field is set, but can also be enabled manually. For example, if you wanted a rule to override an earlier rule you could revert the colors or font settings to defaults by checking the box, but leaving the field at its default setting.
- **Color:** Allows you to select the Foreground (font) and Background (cell/row) colors.
- **Cells Mode (Color):** is enabled when Format Full Row check box is selected. Allows you to specify which columns the formatting rule will be applied to when the User has set Table Color Formatting mode to **Cells**:
  - **Disabled in cells mode:** formatting will not be seen by Users who have Table Color Formatting Mode set to **Cells** or **None**.
  - **Apply to format columns only:** Formatting will be applied to all columns you specified in the Format Columns field. Users will see this formatting when they have Table Color Formatting Mode set to "Cells" or "Row".
  - **Apply to Locked columns only:** formatting will be applied to all locked columns.
  - **Apply to full row always:** Formatting will be applied across the whole row, even if the User has Table Color Formatting mode set to **Cells**.
- **Font:** Allows you to select the font.
- **Cells Mode (Font):** Enabled when **Format Full Row** check box is selected. Allows you to specify which columns the formatting rule will be applied to when **Table Font Formatting** mode is set to **Cells**:
  - **Disabled in cells mode:** Formatting will not be seen by users who have **Table Font Formatting Mode** set to **Cells** or **None**.
  - **Apply to format columns only:** Formatting will be applied to all columns you specified in the Format Columns field. Users will see this formatting when they have Table Font Formatting Mode set to **Cells** or **None**.
  - **Apply to locked columns only:** Formatting will be applied to all locked columns.
  - **Apply to full row always:** Formatting will be applied across the whole row, even if the **Table Font Formatting** mode has been set to **Cells**.
- **Bold:** Enables to apply bold font formatting.
- **Italic:** Enables you to apply italic font formatting.
- **Underline:** Enables you to apply underline font formatting.
- **Strikethrough:** Enables you to apply strikethrough font formatting.
- **Cell Tooltip:** Enables you to enter a descriptive tooltip for the rule. The tooltip is displayed when a user holds the mouse pointer over any cells highlighted with the formatting.
- **Preview:** The Preview pane shows what the formatting rule will look like for users under different formatting modes: **None**, **Cells**, or **Row**. Conditional formatting modes are set by each user from the Web Workspace User menu's **Table Settings** sub-menu. The preview table shows two example locked columns and two example not locked columns.

Understanding Conditional Formatting Precedence Rules

The order that formatting rules are displayed in the **List of Rules** determines which formatting takes precedence.

If only global conditional formatting is used on your system, then cell formatting takes precedence over row formatting:

Cell Formatting	Global cell based formatting rules.
Row Formatting	Global row based formatting rules.

If both Global and Personal conditional formatting are used on your system, then the order of precedence is organized like this:

Cell Formatting	Personal cell based formatting rules. **Note:** The ability to place personal rules before global rules is role based.
	Global cell based formatting rules.
	Personal cell based formatting rules.
Row Formatting	Personal row based formatting rules. **Note:** The ability to place personal rules before global rules is role based.
	Global row based formatting rules.
	Personal row based formatting rules.

Quick Start for Effective Conditional Formatting

There is a lot of flexibility in how you apply conditional formatting. The following topics provide a selection of common conditional formatting tasks. It is not an exhaustive list, but designed to get you started with conditional formatting.

Conditional Formatting Best Practice

- Use conditional formatting sparingly.
- Try to avoid background coloring of entire rows. Instead use cell-based formatting where possible and encourage Users to set their Table Settings to Cells mode.
- Where the whole row does needs to be formatted, try changing the font color or other font attributes.

Quickly Apply a Formatting Rule

This procedure summarizes the process of adding a global formatting rule to a table.

1. Right-click on the table column heading, then select **Edit Global Conditional Formatting**. The Conditional Formatting dialog box is displayed.
2. Click **Add**. The Edit Rule dialog box is displayed.
3. Add the condition(s) to be met for the formatting rule to be applied.
    a. Select the **Column**, **Operator**, and **Value(s)**, then click **Add to List**.
    b. Repeat this step if the formatting rule requires more than one condition to be met.
4. Click the **Formatting** tab.
5. Specify the formatting to be applied to the rule. See **Understanding the Edit Rule Dialog Box** on page 2-19 for a description the fields in this dialog box.
6. Click **OK**. The dialog box closes and the rule is added to the **List of Rules**.
7. Click **OK** to close the Conditional Formatting dialog box.

Apply a Formatting Rule to More than One Cell

It is possible to apply a formatting rule to more than one cell. To do this:

1. In the Conditional Formatting dialog box, double-click a rule to open the Edit Rule dialog box.
2. In the Formatting tab, click on the Format Columns field, and select any additional columns you want to apply the formatting rule to.
3. On applying the change, the additional columns are also highlighted.

Apply a Formatting Rule Based on Multiple Matching Conditions

You can apply formatting to a cell or row where multiple conditions need to be matched. For example, you can highlight outage events in a *New* state where the number of customers off supply is more than 50 customers.

To do this, you need to create a rule, then in the Edit Rule dialog box, simply add two conditions:

- `Status is in NEW`
- `#Out >=50`

Add Personal Conditional Formatting

Applying **Personal** conditional formatting allows users, such as Administrators, to overlay conditional formatting on top of the globally applied formatting. This might be done to check how a new formatting rule looks before applying it as a **Global** formatting rule or by an individual to highlight things important to their role or current activities.

To create a personal conditional formatting rule:

1. Right-click on a column heading, the choose **Edit Personal Conditional Formatting**.
2. On displaying the Conditional Formatting dialog box, note that any globally applied formatting rules are displayed, but they are not editable.
3. Add your personal formatting rule.
4. After adding it, note that you can move it up or down in the list, within the constraints of the Conditional Formatting Precedence Rules, using the **Move Up** and **Move Down** buttons.

   Note: The ability to place personal conditional formatting before global conditional formatting is role based.
5. After applying your changes and closing the dialog box, the table displays the personal and global formatting, but only you can see the personal formatting.

Promoting Personal Conditional Formatting to Global Formatting

If you have applied some personal conditional formatting to a table to test what it looks like, and you permissions to do so, you can promote the personal formatting to be a global rule.

To do this:

1. Right-click the table heading and choose **Edit Global Conditional Formatting**.
2. At the dialog prompt, click **Yes** to assimilate the personal formatting into the global formatting. The personal formatting rule is now promoted to a global formatting rule.

Taking Authority for Control Zones

The Authority tool is used to manage permissions to view data and perform operations in the operations network. Permissions are granted to operate in *Control Zones*, which are discrete sections of a utility's distribution system. *Control Groups* are groups of control zones. You must subscribe to a control zone or a zone group to see events, manage crews, or perform device operations in that section. Once subscribed, you can examine and change the assignment of control zones, view control areas within the distribution system, and identify which users have authority over each section. This section provides information on using the **Authority** tool, including the following topics:

- Using the Authority Tool
- Subscribing to a Control Zone
- Subscribing to an Authority Group
- Unsubscribing from a Control Zone
- Searching for a Zone
- Changing the Rule Set

Using the Authority Tool

If the Authority tool is not visible in the Web Workspace, select **Authority...** from the Web Workspace **Tools** menu.

Authority Tool Fields

The Authority tool has the following fields:

- The **Zones** area displays control zones or control groups.
- **Zone Users** displays the users that are currently subscribed to the selected control zone. If no user is subscribed to the selected control zone, the Zone User will be **system**.
- **Control Zone** displays the currently selected control zone.
- **Rule Set** displays the rule set currently being used.

  Note: Rule Sets are operating conditions, such as *Normal* or **Storm**, that are typically set by Administrators or Shift Supervisors.

Authority Tool Menus

File Menu

Menu Option	Description	Toolbar Icon
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the Authority tool window.	--

Filter Menu

Menu Option	Description	Toolbar Icon
All Zones	Shows all Control Zones in the tree structure.	--
My Zones	Shows all Control Zones controlled by you.	--
Users' Zones	Shows Control Zones that are controlled by users/ operators.	--
System Zones	Shows control zones that are controlled by the System.	--
Zone Groups	Shows the Zone Group table, which allows you to subscribe to or view zone groups.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Subscribe...	Opens the Subscribe window that allows you to subscribe to Control Zones or Control Groups.	
Unsubscribe...	Allows you to unsubscribe from subscribed control zones.	
Zone Search	Allows you to search for a control zone in the control hierarchy.	
Change Rule Set...	Allows you to change the operations rule set.	--
Suppress Callbacks	Suppress callbacks for the selected zones	--
Allow Callbacks	Allow callbacks for the selected zones	--
Enable OMA Self-Assign	Administration users may select this option to allow OMA users to self-assign to events in the selected control zones.	--
Disable OMA Self-Assign	Administration users may select this option to disable OMA users from self-assigning to events in the selected control zones.	--

Help Menu

Menu Option	Description	Toolbar Icon
Authority Help	Opens the online help system to the Authority tool help content.	--

Subscribing to a Control Zone

With the Authority tool filter set to All Zones, the Authority tool lists all control zones in a hierarchical tree view. You may subscribed to an individual control zone, which is represented by a page icon (), or a zone collection, which is represented by a folder icon().

To subscribe to one or more control zones, complete these steps:

3. Expand the list of Control Zones to locate the zone you want to control.
4. Select the row for the zone or zone folder. The zone will populate the Control Zone field.
    - To select multiple adjacent zones, press **Shift** and click the first and last zones to select all of the zones in that range; to select multiple non-adjacent zones, press **Ctrl** and click each zone individually.
5. Click the **Subscribe** button (), select **Subscribe...** from the **Actions** menu, or right-click and select **Subscribe...** from the context menu. The Subscribe dialog box opens.
6. Click **Subscribe** in the dialog box. You are now subscribed to the selected zones.

Subscribing to an Authority Group

To subscribe to a Authority Group, first select Zone Groups from the Authority tool's Filter menu to view the Authority Group table and then complete these steps:

1. Select one or more rows from the Authority Group table. If the list of Authority Groups is long, you may use the filter box above the Authority Group title to find the desired group.
2. Click the **Subscribe** button (), select **Subscribe...** from the **Actions** menu, or right-click and select **Subscribe...** from the context menu. The Subscribe dialog box opens.
3. If applicable, deselect any control zones in the **Authority Group** that you do not wish to subscribe to.
4. Click **Subscribe**. You are now subscribed to the selected zones.

Unsubscribing from a Control Zone

When you are finished working in a control zone, you can unsubscribe from the control zone.

> **Note:** Remember that you are automatically unsubscribed to all of your control zones when you logout.

To unsubscribe, complete these steps:

1. Select **My Zones** from the Filter menu.
2. Select the row containing the zone that you want to unsubscribe from. The zone will populate the Control Zone field.
3. Click the **Unsubscribe** button () to open the Unsubscribe dialog box.

Note: Alternatively, you may select **Unsubscribe...** from the **Actions** menu or select *Unsubscribe...* from the context menu.

4. Click **Unsubscribe**. You are now unsubscribed from the zone.

Searching for a Zone

The Search feature can help you locate a control zone more quickly than expanding and viewing zones in the Authority window. To search for a zone, complete these steps:

1. In the Authority window, click the **Zone Search** button () in the toolbar or select **Zone Search...** from the **Actions** menu. The Search Tool dialog box opens.
2. Enter the name or first part of the name of the control zone in the Zone field and then click the **Find Next** button. The search is not case-sensitive, but you must match exactly in your typing of spaces, hyphens, and so on. If the system finds a match, the list of control zones expands and that zone is highlighted.
3. If there are multiple matches, click **Find Next** to locate the next control zone that matches your search criteria.
4. When you locate the zone you want, click the **Cancel** button to close the Search Tool dialog box.

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Changing the Rule Set

Rule sets are a collection of analysis rules that Oracle Utilities Network Management System Web Trouble uses to determine how and when certain device will be predicted out and how fast a prediction moves upstream. For example, a rule set might cause fuses to be predicted out if three or more service outages are predicted on downstream transformers. Meanwhile, circuit breakers might require five downstream device outages to cause an upstream prediction to them.

You can change the rule set for control zones over which you have authority over using the Authority window.

To change the rule set for a control zone, complete these steps:

1. Select **Authority** from the **Tools** menu in the Work Agenda. The Authority window opens.
2. Select the row of the control zone you want to change.
3. Click the **Change Rule Set…** button. A dialog box opens.
4. In the Rule Sets Available list, select the rule set you want to change to.
5. Click the **OK** button. The rule set for that control zone is updated. Oracle Utilities Network Management System Web Trouble will begin grouping and prioritizing new trouble calls in that control zone based on the new rule set.

Creating an Event

If a crew in the field discovers an event that has not been identified by a customer, you may use the **Create Event** tool to add the event to the NMS.

To open the Create Event window, select **New** and then **Event...** from the Web Workspace **File** menu. Alternatively, you may click the Web Workspace new event button ().

The Create Event window displays the following fields and buttons:

- The **Selected Device** field displays the name of the device on which to create the event.
- The **Event Began** field allows you to enter the date and time when the event began.
- The **Work Queue** drop-down list allows you to select a work queue for the event.
- The **Event Type** selection allows you to designate whether the event should be created as a Probable Device Outage, Probable Stable Device Outage, Non-Outage, or Restored Real Outage.
- The Restored Real Outage Options pane allows you to add the restored time and device phases to a restored real outage event. The **Create Switching Sheet** check box allow you to create an emergency switching sheet for the restored outage (see **Emergency Switching** on page 11-90 for information on emergency switching sheets).
- The **OK** button creates the new event on the selected device and closes the Create Event window.
- The **Help...** button displays help for the current window.
- The **Cancel** button closes the Create Event window without creating a new event.

Using the Work Agenda

The Work Agenda displays event (or work) data. These events vary based on the modules and interfaces that have been implemented, but may include switching actions (with Switching Management), outage events (with Outage Management), and so on. Events may be in various states, such as *New*, *In Progress*, *Incomplete*, or *Complete*.

When you launch Web Workspace, the Work Agenda will be visible as a docked pane. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for information on docking and moving tools.

This section includes the following topics:

- Opening Work Agenda Windows
- Understanding Work Agenda (Filtered) Views
- Using Work Agenda Menus and Toolbars
- Understanding Work Agenda Data Display
- Acknowledging Events

Opening Work Agenda Windows

You can have one or two Work Agendas open. To open a second Work Agenda, select the **Work Agenda 2...** option from the Web Workspace **Tools** menu.

> **Note:** You can reopen Work Agenda 1 if it has been closed by selecting **Work Agenda 1...** from the Web Workspace **Tools** menu.

If you want to give either Work Agenda 1 or Work Agenda 2 focus, select the **Work Agenda 1...** or **Work Agenda 2...** option, respectively, from the Web Workspace **Tools** menu and the window will be brought to the front of other panes.

When you select a row in one Work Agenda window, the system automatically selects the row for that event in all other Work Agendas (if the row is not being filtered).

All Work Agendas are subscribed at the same level as the original Work Agenda and other tools, but can have their own dynamic sorts and filters applied. The selected events are shared across the Work Agendas.

Understanding Work Agenda (Filtered) Views

Work Agenda *views* are filters based on event type and/or status. These filtered views are referred to as *lists* and the list name is displayed on the Work Agenda tab. For example, in the standard NMS product offering, the Web Workspace starts with Work Agenda open in the **To Do** list view, which displays all new and unassigned events that require attention, and the tab is labeled "Work Agenda: To Do."

> **Note:** The Work Agenda does not display any events until you take authority of a control zone (see **Taking Authority for Control Zones** on page 2-24).

Each row of a Work Agenda list contains information about an event. A summary row at the top of the Work Agenda displays summary counts for all of the events listed in the current view.

The Work Agenda is preconfigured with several different Global views that can be selected in the Filters pane's Global section. Your system may also have Shared filters and any Personal filters that you have created and saved. See **Filtering Data Tables** on page 1-11 for more information on Shared and Personal filters.

Understanding Work Agenda Standard Global Filters

The NMS product configuration includes the following Global filters.

Filter Name	Description
All	Displays all events of any status. **Note:** Statuses are displayed in the Work Agenda Status column; see **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.
Completed	Displays all completed and canceled trouble events. **Statuses:** CMP, F-CMP, M-CMP, P-CMP, S-CMP, W-CMP, CNL, F-CNL, S-CNL, and W-CNL. **Note:** See **Event Status Codes** on page C-1 for event status descriptions.
Default	Applies the filter for the currently selected view.
In Progress	Displays most trouble events that have crew resources associated with them and any trouble event alarms. **Statuses:** ASN, F-ASN, S-ASN, W-ASN, ENR, F-ENR, S-ENR, W-ENR, NFY, ONS, F-ONS, S-ONS, W-ONS, RSCH, RST, S-RST, SUS, S-SUS, W-SUS, and VFY. **Note:** See **Event Status Codes** on page C-1 for event status descriptions.
Incomplete	Displays all incomplete trouble events and events that have maintenance work pending. Incomplete events are events that are complete in the field but still require that Event Details be completed. **Statuses:** INC, M-INC, P-INC, S-INC, MNP, and S-MNP. **Note:** See **Event Status Codes** on page C-1 for event status descriptions.
Optimization	Displays Optimization-related events. **Statuses:** O-NEW, O-CMP, and O-CNL. **Note:** See **Event Status Codes** on page C-1 for event status descriptions.

Filter Name	Description
Switching	Displays all events that have an associated planned switching sheet in a **Scheduled** (or later) status.
To Do	Displays trouble events that require attention and any trouble event alarms. **Statuses:** C-CNL, CRT, NEW, F-NEW, M-NEW, P-NEW, S-NEW, NFY, RED, RSCH, SNT, M-SNT, P-SNT, S-SNT, W-SNT, UAS, F-UAS, M-UAS, P-UAS, S-UAS, W-UAS, and VFY **Note:** See **Event Status Codes** on page C-1 for event status descriptions.
To Do & In Progress	Displays trouble events that have resources assigned to them or require attention, along with and any trouble event alarms. This view excludes Dist Gen TTL events. **Statuses:** CRT, C-CNL, NEW, F-NEW, M-NEW, P-NEW, S-NEW, NFY, RED, RSCH, SNT, M-SNT, P-SNT, S-SNT, W-SNT, UAS, F-UAS, M-UAS, P-UAS, S-UAS, W-UAS, ASN, F-ASN, S-ASN, W-ASN, ENR, F-ENR, S-ENR, W-ENR, NFY, ONS, F-ONS, S-ONS, W-ONS, RSCH, RST, S-RST, SUS, S-SUS, W-SUS, and VFY **Note:** See **Event Status Codes** on page C-1 for event status descriptions.

Using Work Agenda Menus and Toolbars

This section lists and describes the menu options and toolbar icons available in the Work Agenda.

File Menu

The table below describes the options available on the **File** menu.

Menu Option	Description	Toolbar Icon
Export Table...	Opens a dialog box that allows you to save the current table view data to a comma separated value (csv) file.	
Print	Displays the Print Preview dialog box so you can view or print the list.	
Print Reading Pane	Displays the Print Preview dialog box so you can view or print the Reading Pane.	
Print Preview Calls...	Opens the Report dialog box that allows you to choose a preview type (for example, PDF, HTML, and so on); click **Preview...**. to display the calls report for the highlighted rows.	

Menu Option	Description	Toolbar Icon
Print Calls...	Opens the Report dialog box that allows you to choose a report type (for example, PDF, HTML, and so on) and printer for the highlighted rows; click **Print** to send the report to the selected printer.	
Email Calls...	Opens the Report dialog box that allows you to choose the type of report (for example, PDF, HTML, and so on) to be generated for each highlighted row; click **Email...** to attach the calls to a new email message (using your default email application) that may then be sent to your chosen recipients.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the Work Agenda window.	--

Tools Menu

The table below describes the options available on the **Tools** menu.

Menu Option	Description	Toolbar Icon
View...	Opens Viewer 1 if not already open, and then focuses Viewer 1 on the device from the selected Work Agenda row.	
Trouble Info...	Opens the Trouble Info tab with information about the selected event.	
Event Details...	Opens the Event Details window with information about the selected event.	
Event Log...	Opens the Event Details Event Log tab for the selected event.	--
Switching...	Opens the **Open or Create New Switching Sheet** dialog box, which allows you to create a new switching sheet or open a switching sheet associated with the selected event. See **Open or Create New Switching Sheet** on page 11-90 for more information.	--
Damage Assessment…	Opens the Damage Assessments tool, which displays a list of damage assessments associated with the selected event and allows you to add additional damage assessments. See **Using the Damage Assessments Tab** on page 3-24.	--
Fault Location Analysis...	Displays the Fault Location Analysis tool for the selected fault event.	--
Show AMI Request…	Displays a list of active and completed AMI requests for the selected event.	--

Sort Menu

The table below describes the options available on the **Sort** menu.

Menu Option	Description	Toolbar Icon
Sort Dialog...	Opens the Sort Dialog, allowing you to create, modify, apply, and save user-defined sorts. See **Using the Sort Dialog Box** on page 1-9.	--
Default	Applies the default sort.	--

Filter Menu

The **Filter** menu allows you to quickly choose to show outages, non-outages, or both to narrow the type of data shown in a filtered view.

Menu Option	Description	Toolbar Icon
Outages	Displays all outage events.	--
Non Outages	Displays all non-outage events.	--
Both	Displays both outage and non-outage events.	--

Actions Menu

The table below describes the options available on the **Actions** menu. It also indicates whether the option displays in a context menu when you right-click a row in the Work Agenda.

Menu Option	Description	Toolbar Icon	Right-Click Y/N
Acknowledge	Acknowledges the selected event.		Y
AMI Confirm	Allows you to request meter pings from the AMI (Advanced Metering Infrastructure) system for the selected event.	--	N
Work Queues...	Opens the Work Queues dialog box, allowing you to select work groups to refer the event to and enter any necessary notes.		Y
Send to Mobile	Changes the event status to a Sent status that is appropriate for the selected event (for example, SNT, S-SNT, P-SNT, M-SNT, W-SNT). Also, if the Sent to Mobile column value happens to be *N* at the time the **Send to Mobile** button is pressed, it will update to a value of *Y*.	--	N
Update ERTs...	Opens the Update ERT dialog box so you can enter a new ERT (Estimated Restoration Time) for all selected events.	--	N

Menu Option	Description	Toolbar Icon	Right-Click Y/N
System-Wide Default ERT...	Opens the System-Wide Default ERT dialog box, which allows you to view and modify the system-wide default restoration time value. (Use the Configuration Assistant to set restoration times for specific control zone-device class combinations.)	--	N
Associate Event...	Allows you to associate the selected fuzzy event to a device.	--	N
Group Events...	Opens the Group Events dialog box, which allows you to manually merge, relate, and un-relate events.	--	N
Undo Grouping and Repredict	Ungroups and repredicts all calls from an event. It may be used to undo the results of manual grouping or repredict upstream/downstream. This action is not allowed for events with crews. See **Ungrouping Events** on page 3-47.	--	N
Update Events...	Opens the Update Events dialog box, which allows you to update multiple Event Details fields for the selected events. See **Using the Update Events Window** on page 3-34.	--	Y
Update All Related Events...	Opens the Update Events dialog box, which allows you to update multiple Event Details fields for all events related to the selected event. See **Using the Update Events Window** on page 3-34.	--	Y
Confirm/ Restore Outage	Provides a submenu with options to confirm outages or convert an active outage event to a non-outage.		
	Confirm Outages... Opens the Confirm Outages dialog box, which allows you to confirm secondary or service outages for customers associated with event devices.	--	Y
	Convert to Non-Outage Converts the active PSO or PDO event to a Non-Outage event.	--	Y
Assign All Related	Assigns the selected crew to the selected event and all related events.		Y
Release Crews...	Opens the **Release Crews** dialog box, which allows you to release assigned en route or onsite crews from an event. See **Releasing Crews from an Event Selected in the Work Agenda** on page 4-24 for more information.	--	Y

Menu Option	Description	Toolbar Icon	Right-Click Y/N
Release from All Related...	Opens the Release Crews dialog box, which allows you to release assigned, en route, or onsite crews from an event and all related events.	--	Y
Cancel Event...	Cancels the selected event. A dialog box opens prompting you for a reason for the cancellation.		Y
Incomplete	Changes the status of the event to an Incomplete status that is appropriate for the selected event (for example, INC, S-INC, P-INC, M-INC).	--	N
Display Fault Locations	Displays the fault locations in the viewer. If there is more than one possible location, the viewer zooms out to show all locations, and big symbols is enabled.		Y
Hide Fault Locations	Hides the fault locations for this event in the viewer.		Y
Make Predicted Stable	Makes currently selected predicted outage stable. Visible only when currently selected predicted outage can be made stable. See **Working with Stable Predictions** on page 3-49 for more details.		Y
Remove Predicted Stable	Removes stable flag from the currently selected predicted stable outage. Visible only when predicted stable outage is selected. See **Working with Stable Predictions** on page 3-49 for more details.		N
Reading Pane	Splits the Work Agenda table to display a pane with the selected row's details.		N
Abort DMS Processing	Aborts FLISR or Optimization processing.		
Show Event Note...	Enables a balloon dialog box that displays event notes, if they exist.		Y
Toggle Auto Filter	Allows you to quickly filter the table by the selected cell value.	--	Y
Find Selection	Scrolls the currently selected event back into view should it scroll off of the list.	--	N
Load Completed Events	By default, completed events are not loaded into the Work Agenda on startup for performance reasons. This action will open the Load Completed Events dialog box.	--	N

Menu Option	Description	Toolbar Icon	Right-Click Y/N
Load Completed Events - Range...	Opens the Load Completed Events - Range dialog box, which allows you to filter completed events by a start and end date. **Note:** the total number of events returned is bounded by the `RULE_VALUE_INTEGER_1` field of the completedRetainPeriod SRS rule. See the **Using the Event Management Rules Tab** on page 24-16 for more details.	--	N
Load Completed Event…	Opens the Load Completed Event Dialog, which allows you to load a specific completed event by specifying its Event number (index).	--	N
Generate Restoration Callbacks	Generate restoration callbacks for the selected row.	--	
Cancel Callbacks	Cancels callback requests for selected event.		N
Create Follow-Up Event...	Displays the Create Event dialog to create a new related event.		

Help Menu

The table below describes the options available on the Help menu.

Menu Option	Description	Toolbar Icon
Work Agenda Help	Opens the online help system to the Work Agenda tool help content.	--

Understanding Work Agenda Data Display

The Work Agenda displays data in a summary row and an events list table.

Understanding the Work Agenda Summary Row

The summary row tabulates data for the events in the displayed (filtered) events list.

- The **Total Events in View** field displays the number of events.
- The **Est Customers Out** field displays the number of customers estimated to be affected.
- The **Calls** field displays the number of calls received.
- The **Priority Calls** field displays the number of priority calls received.
- The **Emergency Customers Out** field displays the number of impacted emergency customers.
- The **Medical Customers Out** field displays the number of impacted medical customers.
- The **Key Customers Out** field displays the number of impacted key customers.
- The **Sensitive Customers Out** field displays the number of sensitive customers.
- The **Crews En Route/Onsite** field displays the number of crews en route or onsite.

The last three columns are based on the total counts (in your subscribed control zones) and, unlike the other Summary Row columns, ignore any filters:

- The **Priority To Do** field displays the number of priority events that are in the To Do list.
- The **Normal To Do** field displays the number of normal events that are in the To Do list.
- The **In Progress** field displays the number of in progress events.

Understanding the Work Agenda Events List

The Events List provides a tabular view of events. The filter and sort criteria are displayed above the table; the Work Agenda tab displays the selected list view/filter (for example, To Do, All, In Progress, and so on).

Events List Columns

- The **+** column, which is only displayed when in Condensed View, displays a plus + symbol when a row can be expanded. Rows with the **+** symbol indicate that there are related events that are summarized in the condensed row.
- The next column displays event status symbols (for example, a checkmark (✔) for Acknowledged events).
- The **Status** column displays the status assigned to the event. See **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.
- The **+** column displays a plus (**+**) or minus (**-**) sign for lead events when in the condensed view. See **Using the Events List Condensed and Sub-Events Views** on page 2-43 for more information.

- The **Event #** column displays the number the system has assigned to the event.
- The **Feeder** column displays the name of the feeder associated with the event.
- The **DMS Status** column describes any FLISR, FLA, Optimization, or DistGen Violations or Warnings that have occurred for the event.

  Note: The **DMS Status** column is only visible if DMS (Distribution Management System) modules are licensed. For more information, see **Understanding FLISR Events in the Work Agenda** on page 18-9, **Understanding Fault Events in the Work Agenda** on page 19-3, or **Understanding Optimization Events in the Work Agenda** on page 14-8.
- The **E/H** column indicates whether the event is an extreme emergency (**E**) or has hazardous (**H**) conditions.
- The **Start Date** column contains the date and time the event began.
- The **# Out** column contains the number of customers experiencing an outage for the event.
- The **Still Out** column contains the number of customers still experiencing an outage for the event.
- The **Assoc. # Out** column contains the sum of the **Still Out** column of outage events associated to this event. This is only populated for non-outage events. The **Assoc. # Out** column is hidden by default.
- The **Rel Event #** column contains the event number of the parent or lead event when the event has a special relationship with one or more other events.
- The **#Haz.** column contains the number of hazard calls for the event.
- The **Run CMI** column contains the current *customer minutes interrupted* value for the event. Note that this value is automatically updated once a minute. By default, the CMI is 0 for restored events, but this can be customized
- The **# Calls** column contains the number of calls received for the event.
- The **Clues** column contains the clue codes for the calls received, if any.
- The **Phases Out** column contains the phases predicted out for the event.
- The **Device** column contains the name of the device associated with the event. When in the Condensed View, the **Device** column is replaced by two separate columns:
  - **Original Device:** displays the lead event device.
  - **Current Device:** displays a comma-separated list of active sub-event devices.
- The **Location** column contains either the address of the first customer that called if the event is a service outage or non-outage or the feeder location of the device if the event is adevice outage.
- The **Crew** column contains the crew ID of associated crews.
- The **Crew Type** column contains the list of crew types associated with the event.
- The **Est Restore Time** column contains the estimated restoration time (ERT) for the event.

- The **Est Src** column contains the source of the ERT for the event. The possible values for the ERT Source, from highest precedence to lowest, are as follows:
  - **U:** User-entered via applications or tools (for example, Work Agenda, Event Details, or Crew tools) other than Storm Management.
  - **C:** Crew-entered via the mobile interface.
  - **G:** Storm Management published global ERT from the ERT Override dialog box.
  - **P:** Storm Management non-published global ERT from the ERT Override dialog box.
  - **D:** Storm Management published global ERT delay from the ERT Override dialog box.
  - **m:** Minimum ERT is not reached. The ERT is below the set threshold for minimum ERT; no ERT is shown.
  - **M:** Maximum ERT exceeded. The Storm Management calculated ERT is beyond a set threshold for maximum ERT; no ERT is shown.
  - **O:** Storm Management on-site ERT calculated when the crew changes to onsite.
  - **E:** ERT generated by Storm Management while a crew is en route to the event.
  - **S:** Storm Management calculated ERT based on outages and crews in Storm Management.
  - **I:** Initial default ERT, based on device class and control zone.
  - **W:** system-wide default ERT.
  - **N:** none (no ERT)
  - **A:** Auto-extended ERT. The extension time is determined by an event rule, which is set by Administrative Users in the Configuration Assistant.
- The **Prediction Type** column contains the type of prediction (for example, New, Revised, Device Operation, and so on) or type of notification for NFY events (for example, Crew contact required).
- The **Restore Date** column contains the actual restoration date and time of the event.
- The **# Crit** column contains the total number of critical customers experiencing an outage for the event.
- The **# Emer.** column contains the number of emergency customers experiencing an outage for the event.
- The **# Med.** column contains the number of medically urgent customers experiencing an outage for the event.
- The **# Key** column contains the number of key customers experiencing an outage for the event.
- The **# Sens.** column contains the number of sensitive customers experiencing an outage for the event.

- The **Evt Type** column contains a description of the type of event. See **Event Type Codes** on page C-5 for a complete list of event type codes and their descriptions.
- The **Work Queues** column contains a comma-separated list of names of the work group queues that the event has been referred to.
- The **Region** column contains the control zone region where the event occurred.
- The **Branch** column contains the control zone branch where the event occurred.
- The **Substation** column contains the control zone substation where the event occurred.
- The **Plan #** column contains the switching sheet number associated with the event, if any. The switching sheet number is prefixed by the switching sheet type (such as "Plan" or "Emer").
- The **Grp Type** column indicates whether the event is manually grouped or related. The possible types are:
  - **GRP:** manually grouped
  - **REL:** manually related
- The **Rel Type** column contains the type of special relationship that the event is involved in. The possible types are:
  - **L:** lead event of a partial restoration
  - **M:** momentary
  - **N:** nested
  - **P:** non-lead event of a partial restoration
  - **R:** manually related
  - **S:** switching (relationship between switching jobs and planned outages)
  - **A:** automatic (automatically created based on configuration)

If an event has more than one relationship, only the most important relationship is shown. The priority in descending order is S, L, P, N, M, R, A

- The **Sent to Mobile** column indicates whether or not the event is in a state that makes it eligible to be sent to the mobile system.
- The **AMI Request** column indicates whether or not a request was made to the AMI system to verify power to the meter.
- The **# Power Ups** column displays a running total of AMI meters, associated with the outage, that have responded with a power-up message. It requires that AMI integration is in place to support it.
- The **Dmg Asmt** column displays whether a damage assessment is needed and, if so, the status of the damage assessment. Possible values are:
  - **None:** damage assessment is not required. This is the initial state for new events.
  - **Needed:** damage assessment is required for the event, but not yet started. This state indicated that the event is assigned to an assessment work queue or an assessment crew is assigned to the event.

- **Started:** damage assessment has been started for this event. This state indicates that an assessment crew is en-route or there is at least one damage assessment in the New state for the event.
- **Assessed:** damage has been assessed. This state indicates that there is at least one damage assessment in the Assessed state and no damage assessments in the New state for the event.

- The **Appt Type** column indicates the type of appointment scheduled using the types in the Web Call Entry application. See **Appointment Request** on page 5-8 for more information on scheduling appointments.
- The **Appt Range** column indicates the window of time given for a scheduled meeting. See **Appointment Request** on page 5-8 for more information on scheduling appointments.
- The **Appt Date** is the date an appointment has been scheduled for a customer meeting. See **Appointment Request** on page 5-8 for more information on scheduling appointments.
- The **Wgt Out** column displays the sum of weighted priority values for all the customers experiencing an outage for the event. See **Using the Customer Administration Weighted Priority Editor** on page 24-68 for more information on weighted priority.
- The **Stable?** column displays **Yes** for stable predicted outages; otherwise, it displays '`No`.' See **Working with Stable Predictions** on page 3-49 for details.
- The **Radial** column displays **Yes** for device outages that are not possible to backfeed (the outage cannot be fully or partially restored by closing any other devices).

A **No** value means that either:

- There are devices that can be closed to fully/partially restore an outage.

or

- The system is not enabled to detect backfeed solutions.

Note: The **Radial** functionality is disabled by default in the standard product configuration. It may be enabled with the **Configuration Assistant Event Management Rules** tab (**detectBackfeedable** with `rule_value_1 = 'yes'`). See **Using the Event Management Rules Tab** on page 24-16 for details on search for and editing rules.

The **Radial** column is hidden by default.

Sorting, Selecting, and Locking Events List Columns

When you right-click the events table header, a context menu displays a list of options that allow you to perform the following functions:

Menu Option	Description
Sort...	Displays the Sort Dialog so you can modify the default sort. See **Using the Sort Dialog Box** on page 1-9.

Select Columns...	Opens a dialog box that displays a list of columns that can be displayed in the Work Agenda table. A checkmark appears next to columns that are currently displayed. To remove a column from the table, deselect the box. To add a column that is not currently displayed, check the box. Click **OK** to exit. **Note**: These settings are applied immediately and affect only the current user session. To save these settings as the default view for the Work Agenda (for the currently logged-in user), select **Save Preferences** from the Web Workspace **Preferences** menu.
Unlock Columns	When the Work Agenda is first launched, the first four columns are locked in place so they stay in view as you scroll the table to the right. • You may unlock the columns by choosing **Unlock Columns** from the context menu. • With the columns unlocked, you may lock columns by right-clicking the column you wish to be the right-most frozen column.

The Work Agenda table supports Quick Sorting, Dynamic Filtering, and Auto Filtering.

Using the Events List Condensed and Sub-Events Views

When the Condensed View check box is selected (default), related event rows will be condensed to a single summary row. The **+** column appears and displays a **+** symbol on the condensed row. The condensed row's **Event #** field also indicates that there are sub-events with an additional asterisk (*) after the event number. The **Device** column expands to display the **Original Device** and the **Current Device** columns.

Clicking the plus symbol (**+**) in a condensed row will open the **Sub-Events** view, which displays the sub-events for the selected condensed row. Click the **X** button to close the **Sub-Events** and go back to the Condensed View.

Using the Work Agenda Reading Pane

The Work Agenda Reading Pane provides a summarized view of data for an event selected in the Work Agenda or Viewer.

Fields:

- **Event Information**
  - **Event #:** Displays the number the system has assigned to the event.
  - **Start Date:** Displays the date and time the event began.
  - **Est Restore Date:** The estimated restoration time (ERT) for the event.
  - **# Out:** The total number of customers experiencing an outage for the event.
  - **# Emergency:** Contains the number of emergency customers experiencing an outage for the event.
  - **#Medical:** Contains the number of medically urgent customers experiencing an outage for the event.
  - **# Key:** Contains the number of key customers experiencing an outage for the event.
  - **Device:** Contains the name of the device associated with the event.
  - **Zone:** Contains the affected Control Zones.
  - **Phases Out:** Contains the affected phases.
- **Clues:** Contains any clues associated with the event.
- **Switching Plan...:** Click to open or create a new switching plan. Associated plans are listed in the field next to the button. See **Web Switching Sheets** on page 11-4.
- **Event Crews:** Provides a crew data table with information about crews assigned to the event. See **Managing Crews with Web Trouble Management** on page 4-1.
- **Call Comments:** Lists call comments.
- **Operations Event Note:** Lists operations event notes.

Acknowledging Events

To acknowledge an event, complete these steps:

1. Select the row of the event with NEW, S-NEW, P-NEW, M-NEW, or RED status in the Work Agenda Events List.
2. Click on the **Acknowledge** toolbar button or select **Acknowledge** from the **Actions** menu. The event becomes acknowledged and its status changes accordingly.

Using the Viewer

The Viewer presents a graphical representation of the distribution system, with additional symbology for conditions such as outages, crew locations, notes, tags, and so on. The Viewer dynamically updates with condition and distribution changes.

This section includes the following topics:

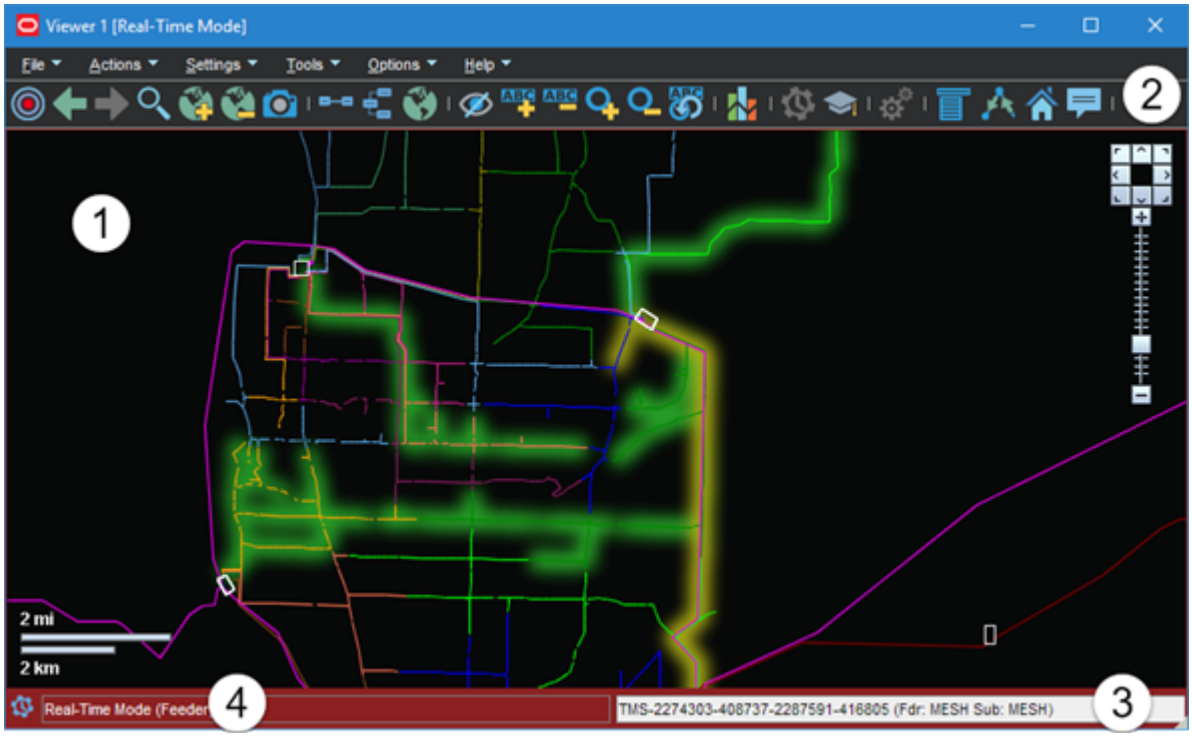
- Starting the Viewer
- Understanding the Viewer
- Displaying Device Details
- Understanding Viewer Coloring
- Searching and Loading Viewer Maps
- Navigating in the Viewer
- Viewer Focus
- Using Feeder Focus
- Using Lens Windows
- Real-Time and Study Mode
- Selecting Devices
- Identifying Symbology
- Hiding and Displaying Viewer Objects
- Executing Traces
- Using the Commissioning Tool
- Using the Save Case Management Tool

Starting the Viewer

To open a Viewer, select the **Viewer 1...** option on the Web Workspace **Tools** menu. To start a second Viewer, select **Viewer 2...** After you have opened the Viewer, selecting the menu option will change the focus to that Viewer.

Understanding the Viewer

The following diagram shows the functional areas of the Viewer:



Viewer Functional Areas Legend:

1: Understanding the Viewer Drawing Area

2: Using the Viewer Menus and Toolbar

3: Understanding the Viewer Message Area

4: Real-Time and Study Mode Indicator and View Setting

Understanding the Viewer Drawing Area

The Viewer's drawing area displays dynamic maps that reflect the status of the system. The lines (used to represent conductors) and the icons (used to represent devices and conditions) are called *symbols*; the conventions that govern symbols are referred to as *symbology*.

Certain condition symbols, such as event type or note indicator, provide tooltips indicating the symbol's meaning. For example, as shown in the illustration above, the Note symbol's hover text is *Operator Note*.

If configured, the Viewer will dim the parts of the model that are outside of the user's authority. In those sections, the user will not be able to operate or otherwise modify those devices without taking authority using the Authority tool (see **Taking Authority for Control Zones** on page 2-24).

Understanding the Viewer Message Area

The Viewer's message area displays device aliases, feeder names, and substation names.

Using the Viewer Menus and Toolbar

The Viewer's menus and toolbars provide access to common functions.

File Menu

Option	Description	Toolbar Button
Print	Opens the Print Preview window, which allows you to print the contents of the Viewer window.	
Exit	Exits the Viewer.	--

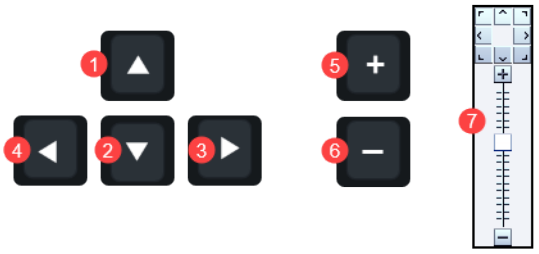
Actions Menu

Option	Description	Toolbar Button
Focus	Focuses the Viewer on selected devices or devices associated with selected events. See **Viewer Focus** on page 2-67 for details.	
Back	Moves to the previous view before a pan, zoom, or object focus operation (if any) changed the focus location in the Viewer. This button functions similarly to a web browser back button, storing a dozen "views." However, the loaded maps, the hide/display layers, and other options will use the current settings.	
Forward	Moves to the next view if the **Back** button has been used. It functions similarly to a web browser's forward button. However, the loaded maps, the hide/display layers, and other options will use the current settings.	
Search	Opens the Search dialog box, which allows you to enter search criteria and execute a search in the Viewer.	
Load Maps	Allows you to explicitly load additional maps to display more of the surrounding area or additional detail.	
Unload Maps	Unloads all maps, not just those in the visible drawing area.	
Save View Area...	Saves the viewing area after prompting for a name for the saved area. If a view area already exists with that name, you will be asked if you want to replace it.	
Delete View Area...	Deletes the viewing area after prompting for confirmation.	--
Show Lens	Opens a Lens window zoomed in on selected device. See **Using Lens Windows** on page 2-72.	--
Feeder Focus	Shows the selected device's feeder at a zoom level that will allow the Viewer to display the feeder in its entirety.	--
Change Focus Feeders...	Opens the **Select Feeders to Display** dialog that lists the feeder in focus and all adjacent feeders allowing you to select (or deselect) which feeders to view in Feeder Focus. **Feeder Focus on Adjacent Feeders** on page 2-70.	--
Feeder One Line	View the feeder one line for the selected object.	
Schematic Diagram	Focus the Viewer on the selected device or associated selected events in the schematic view is available.	
View Browser Map	Opens a web browser map to display the geographic area.	
Focus on Feeder Breaker	Focuses the Viewer window on a breaker currently feeding the selected device. If the device is deenergized, the nominal breaker will display.	

Option	Description	Toolbar Button
Hide/Display...	Opens the Hide / Display dialog box, which allows you to select what information will be displayed on the map. See **Hiding and Displaying Viewer Objects** on page 2-79.	
Toggle Landbase	Turns the background landbase map on or off.	--
Toggle SCADA View	Removes all non-essential devices to only show the feeder backbones and SCADA devices. The device classes that are shown in this view can be configured on a project basis and tuned as needed.	
Feeder Names	Causes the right status bar to display the names of the feeders and substations feeding the selected device for parallel or meshed conditions; for tie points, it will display the names of both feeders.	--
Pointer Coordinates...	Opens a dialog box that displays the geographic coordinates for a selected object.	--
Group Events...	Opens the Group Events dialog box, which allows you to manually merge, relate, and un-relate events.	--

Navigate Menu

The **Navigate** menu lists the Viewer's navigation keyboard shortcuts and allows you to select whether the Viewer's **Pan and Zoom Control** is displayed in the Viewer Drawing Area. Navigation keyboard shortcuts use the keyboard arrow keys and the numeric keypad plus (+) and minus (-) keys (not the keyboard's number row).



#	Option	Description	Keyboard Shortcut
1	**North**	Moves the map to the north.	**Up**
2	**South**	Moves the map to the south.	**Down**
3	**East**	Moves the map to the east.	**Right**
4	**West**	Moves the map to the west.	**Left**
5	**Zoom In**	Zooms in on the map to show a smaller area in more detail.	**Plus**

#	Option	Description	Keyboard Shortcut
6	**Zoom Out**	Zooms out on the map to show a larger area.	**Minus**
7	**Show Pan and Zoom Control**	Check box allows you to select to display the Viewer Pan and Zoom control; deselect to hide the control.	--

Settings Menu

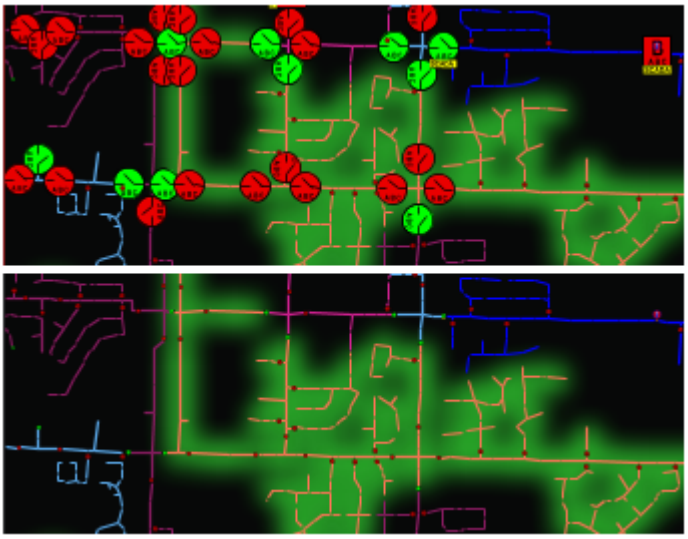
Option	Description	Toolbar Button
Fixed Size	This mode will keep the symbol and text sizes the same regardless of the zoom level.	--
Text Bigger	Increases the text font size.	
Text Smaller	Decreases the text font size.	
Symbols Bigger	Increases the size of symbols.	
Symbols Smaller	Decreases the size of symbols.	
Attributes Farther	Displays attributes (for example, flags, note symbols, and so on) away from the device. Each subsequent action moves the attribute farther away.	--
Attributes Closer	Displays attributes closer to the device.	--
Reset Scale	Resets the size of symbols and text to its default size.	
Unload Maps on Map Load	Selection that sets the Viewer to unload previously loaded maps before loading another map.	--

Tools Menu

Option	Description	Toolbar Button
Commissioning Tool	Opens the Commissioning Tool. See **Using the Commissioning Tool** on page 2-90.	
Assessment Tool...	Opens the Assessment Tool. See **Using the Assessment Tool** on page 2-92.	
Feeder Load Management...	Opens the Feeder Load Management window. See **Feeder Load Management** on page 17-1.	
Suggested Switching...	Displays the Suggested Switching wizard. This option is only enabled if a device is currently selected in the Viewer. See **Using the Suggested Switching Tool** on page 13-3.	--
Optimization...	Displays the Optimization wizard. This option is only enabled if a device is currently selected in the Viewer. See Chapter 14, Network Optimization Tool for information.	--

Options Menu

Option	Description	Toolbar Button
View Phases	Sets the Viewer's drawing areas to show conductor coloring by phases.	--
View Feeders	Sets the Viewer drawing area to feeder coloring mode.	--
View Currents	Sets the Viewer's drawing areas to show coloring by the current range. See Chapter 12, **Viewer Power Flow Information Visualization** on page 12-3, for more information.	--
View Loading	Sets the Viewer's drawing areas to show coloring by load (that is, the per unit current range). See Viewer Power Flow Information Visualization, **Viewer Power Flow Information Visualization** on page 12-3, for more information.	--
View Voltage Per Unit	Sets the Viewer's drawing areas to show coloring by voltage per unit (that is, the per unit voltage range). See Chapter 12, **Viewer Power Flow Information Visualization** on page 12-3, for more information.	--
View Nominal Voltages	Sets the Viewer's drawing areas to show coloring by the nominal voltage range. See Chapter 12, **Viewer Power Flow Information Visualization** on page 12-3, for more information.	--
View Limits	Sets the Viewer's drawing areas to show conductor coloring by their Amp limits.	

Option	Description	Toolbar Button
Show Flow Direction	Overlays flow direction arrows the selected view option. See Chapter 12, **Flow Direction** on page 12-8, for more information.	--
Big Symbols	Allows you to toggle the display of Big Symbols, which are enlarged versions of normal symbology that allow you to see certain device types and conditions when zoomed out. In the following image, Big Symbols are active in the top view and inactive in the bottom view. 	--
Show PF Options	Toggles the display of study session parameters in the Viewer when in study mode. See **Viewing and Modifying Study Session Parameters** on page 17-33 for more information.	--
Real Time	If you are currently in Study mode, select this to switch to real-time mode. If you are currently in real-time mode, this is grayed out. For more information on real-time mode, see **Real-Time and Study Mode** on page 2-73.	
Study	If you are currently in real-time mode, select this to switch to Study mode. If you are currently in Study mode, this is grayed out. For more information on study mode, see **Real-Time and Study Mode** on page 2-73.	

Option	Description	Toolbar Button
Study Mode	**Reset to Real-Time:** reset the study session to the current real-time model.	
	Reset to Nominal: reset the study session to the nominal model.	
	Reset...: displays the Reset Study Session dialog, which allows you to reset your session, and, optionally, add or remove DMS for it.	
	Save Case Management...: opens the Save Case Management tool, which allows you to view, modify, delete, or reset to session changes. See **Using the Save Case Management Tool** on page 2-94 for more information.	
	Close Study Session: closes the study session and returns the Viewer to real-time mode.	
DMS in Study Session	This option allows users to enable DMS tools before starting their next study session. These users can also close their sessions and re-initialize them to change the DMS in Study Session option. Users with DMS_STUDY_MODE permission will notice that the DMS in Study Mode check box is checked by default.	
Power Flow Real-Time Options...	The **Power Flow Options** button opens the Power Flow Options dialog box.	

Help Menu

Option	Description	Toolbar Button
Viewer Help	Opens online help content for the Viewer.	--
Color Legend	Opens the Color Legend window, which displays information about symbology coloring. See **Understanding Viewer Coloring** on page 2-61 for more information.	--
Highlight Legend	Opens the Highlight Legend window, which displays information about the current view. See **Understanding Viewer Coloring** on page 2-61 for more information.	

Additional Viewer Toolbar Options

The following toolbar options do not have corresponding menu options:

Option	Description
	The **Control Tool** button opens the Control Tool for the selected device. The Control Tool may also be opened by double-clicking a device or by right clicking the device and selecting **Control Tool...** from the context menu. (See **Using the Control Tool** on page 2-99.)
	The **Trace** button opens the Trace tool window, set to the current device. The Trace tool may also be started by right clicking the device and selecting **Trace...** from the context menu. (See **Executing Traces** on page 2-84.)
	The **Supply Points Mode** button causes the Viewer to display supply points for potential selection. This allows supply points to be graphically grouped and added to an outage.
	The **Device Details** button toggles device details on or off. Device Details may also be toggled on or off by right clicking the device and selecting **Device Details...** from the context menu. (See **Displaying Device Details** on page 2-58.)

Saving Viewer Preferences

When you have adjusted the Viewer options to render symbols, text, and window information as desired, you may select **Save Preferences** from the Web Workspace **User** menu's **Manage Preferences** submenu to save the options for subsequent sessions.

Understanding Viewer Tooltips

When you hover over a crew, an event, a device, or a condition, a tooltip will appear. This tooltip displays characteristics of the crew, event, device, or condition, such as the crew name, type, event number, etc. Move your mouse over the tooltip to keep it visible. Otherwise, it will disappear after a few seconds.

Understanding Viewer Context Menu Options

When you select certain objects in the Viewer and right-click, a context menu will display a list of options available for the object.

Crew Context Menu Options

The following options are displayed when you right-click a crew symbol in the Viewer window; these options are only available for crews with AVL (Automatic Vehicle Location) systems.

Menu Option	Description
Assign	Assigns the crew selected in the Viewer to the event currently selected in Work Agenda. See **Assigning a Crew to an Event** on page 4-14 for more information.

Menu Option	Description
En Route	Puts the crew selected in the Viewer en route to the event currently selected in Work Agenda. This is enabled only if the selected crew is an on-shift, available, non-mobile crew that is not currently en route or onsite. See **Placing a Crew En Route** on page 4-14 for more information.
Release Crew	Releases the crew selected in the Viewer from the en route/onsite event selected in the Work Agenda. See **Releasing Crews from an Event** on page 4-24 for more information.
Update Availability...	Opens the Update Crew Availability dialog box for the selected crew. See **Changing Crew Availability** on page 4-9 for more information.
Crew Info...	Opens the Crew Info dialog box for the selected crew. See **Using Crew Info** on page 4-15 for more information.

Event Options

The following options are displayed when you select an event symbol and right-click to open the context menu:

Menu Option	Description
Event Details...	Opens the Event Details window for the event. See **Understanding Event Details** on page 3-1.
Trouble Info...	Opens the Event Details Trouble Info tab for the event. See **Using the Trouble Info Tab** on page 3-10.
Event Log...	Opens the Event Details Event Log tab for the event. See **Using the Event Log Tab** on page 3-27.
Damage Assessments...	Opens the Event Details Damage Assessments tab. See **Using the Damage Assessments Tab** on page 3-24.
Show Fault Locations	Shows the fault locations for the selected event.
Hide Fault Locations	Hides all potential fault locations for the selected event.
Crew Info...	Opens the Crew Info window for the crew assigned to the selected event. See **Using Crew Info** on page 4-15.
Show En Route Location...	Shows the AVL location of the crew that is currently en route to the selected event. This option is only enabled when one crew is assigned to the event.
Release Crews...	Opens the Release Crews dialog box. Enabled when one or more crew is assigned to the event. See **Releasing a Crew from the Crew Symbol in the Viewer** on page 4-25.
Make Predicted Stable	Makes currently selected predicted outage stable. Visible only when currently selected predicted outage can be made stable. See the **Working with Stable Predictions** on page 3-49 for more details.

Menu Option	Description
Remove Predicted Stable	Removes stable flag from the currently selected predicted stable outage. Visible only when a predicted stable outage is selected. See the **Working with Stable Predictions** on page 3-49 for more details.

Condition Options

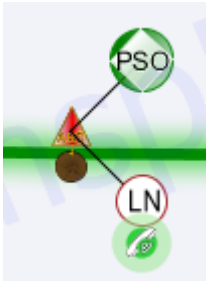
Condition sizing and locations can be adjusted by an administrator; non-administrators can move conditions temporarily during their session. For conditions, moving a condition affects any conditions at a device position, including future conditions for that device. Measures and conditions may be moved.

Menu Option	Description
Move	Moves a condition to a new location. If there are multiple conditions at a location, only the condition closest to the device can be moved.
Show Leader Line	Shows the leader line for the device.
Hide Leader Line	Hides the leader line.
Reset Location	Resets the condition position to the default location.
Rotate Clockwise	Rotates the symbol clockwise (only available for measurements).
Rotate Counterclockwise	Rotates the symbol counterclockwise (only available for measurements).
Resize Bigger	Increases the symbol size (only available for measurements).
Resize Smaller	Reduces the symbol size (only available for measurements).

Device Options

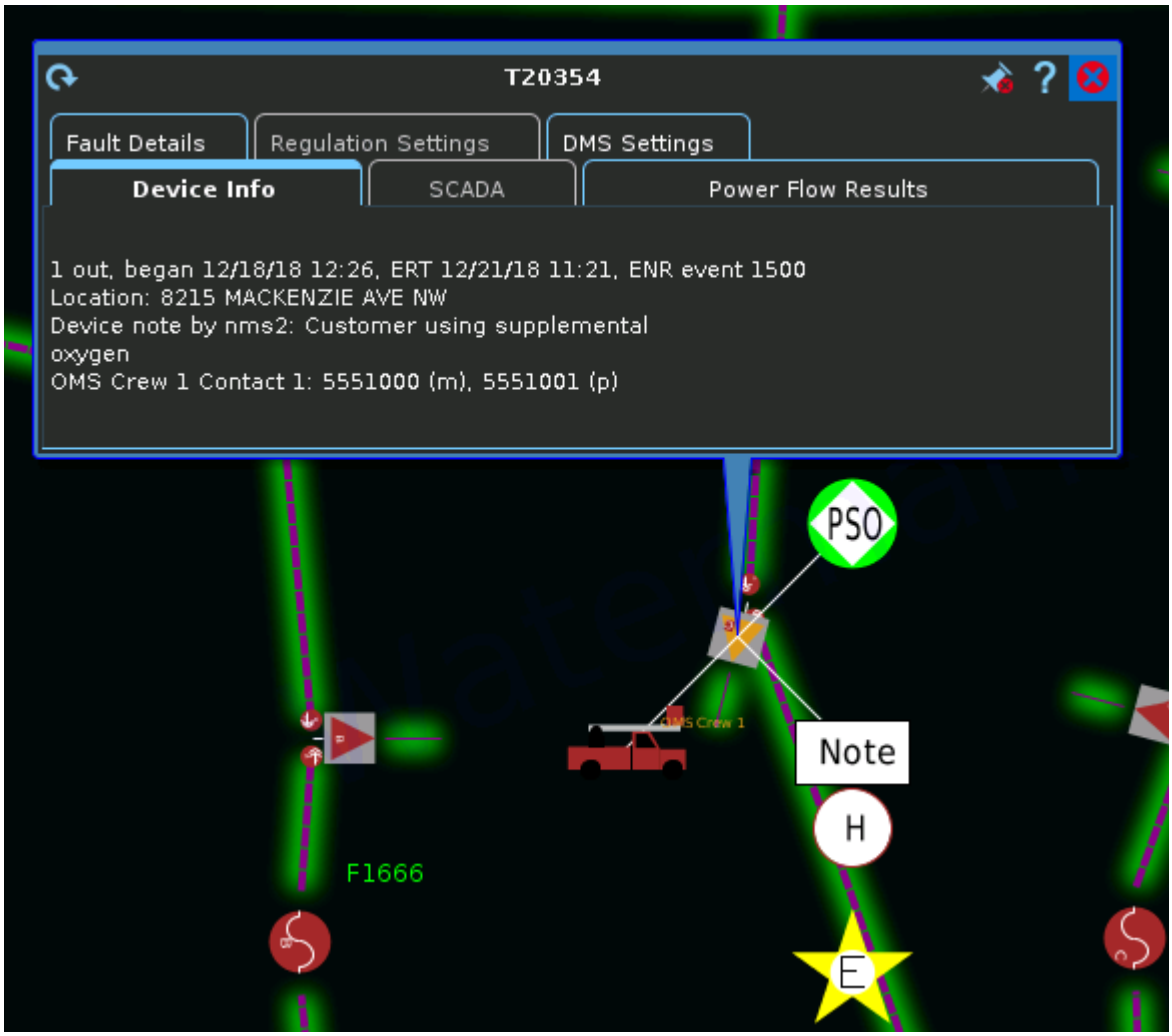
Depending on the device type, the following options may be displayed when you select a device and right-click to open the context menu:

Menu Option	Description
Control Tool...	Opens the Control Tool for the selected device. See **Using the Control Tool** on page 2-99.
Device Details...	Displays the Device Details balloon above the selected device. See **Displaying Device Details** on page 2-58.
Attributes...	Opens the Attributes window, which displays information about the selected device. See **Viewing Device Attribute Information from the Viewer** on page 2-61.
Open...	Initiates the Control Tool's Open command. See **Control Tool Actions** on page 2-101.
Close...	Initiates the Control Tool's Open command, if applicable. See **Control Tool Actions** on page 2-101.
Customer List...	Displays the Event Details Trouble Info tab's Customers List view. See **Using the Trouble Info Customers View** on page 3-19 for more information.

Menu Option	Description
Damage Assessments...	Opens the Event Details Damage Assessments tab, which displays a list of damage assessments associated with the device and allows you to add new damage assessments. See **Using the Damage Assessments Tab** on page 3-24.
Quarantine	Add a quarantine assessment condition. See **Assessment...** on page 2-103.
Start Patrolling	Add a Start Patrolling assessment condition. See **Assessment...** on page 2-103.
Remove Assessment	Remove the assessment condition. See **Assessment...** on page 2-103.
Focus on Feeder Breaker	Focuses the Viewer window on a breaker currently feeding the selected device. If the device is deenergized, the nominal breaker will display.
Generate Tag Steps	Allows you to generate a set of steps in the active switch sheet to tag devices upstream from the selected device. These will appear in a new *Place Tags* steps block.
Toggle Call Display	Toggles call display on or off. When enabled, a symbol is displayed in the Viewer window for any devices that have calls associated with an event. Events with calls and clues will show the call symbol and clue symbol. 
Trace...	Opens the Trace tool, which allows you to display the path from a selected device to other devices based on specific criteria. See **Executing Traces** on page 2-84.

Displaying Device Details

Device Details provides information about devices selected in the Viewer. Device Details is enabled by clicking the **Device Details** button ( ) in the Viewer's toolbar or by right-clicking a device and selecting **Device Details...** from the context menu.



Note: The Viewer's **Device** Details button is highlighted when enabled.

When **Device** Details is enabled, selecting a device will automatically launch a balloon-style callout window attached to the device in the Viewer. Selecting a different device will close the first window and open a window for the newly selected device. To keep a window open, you may pin it by clicking the pin button ( ). You may unpin the window by clicking the unpin button ( ) or close it by clicking the close button ( ). **Device** Details windows may be dragged to a different location in the Viewer or resized.

The **Device** Details tabbed data views provide relevant information based on the object selected. Data is refreshed whenever you select a different tab, but you may manually refresh the data by clicking the refresh button ( ). Click the **Help** button ( ) to display help for the active tab.

The **Device Details** tabs provide the following information:

Device Info: The information contained in the **Device** Info tab varies depending on the type of **device** and its current condition, but may include the following types of information:

- Event information, such as number of customers affected, when the event began, estimated restoration time, event type, event number
- Event Note
- Location
- Device Notes
- Crew information

- **SCADA:** The SCADA tab displays SCADA device data. It is only enabled for SCADA devices in systems that have implemented SCADA Extensions; see **Displaying SCADA Measurements with Device Details** on page 10-26 for details.
- **Power Flow Results:** The Power Flow Results tab displays Power Flow calculation results. It is only enabled in systems that have implemented Power Flow Extensions; see **Understanding the Device Details Power Flow Results Data Table** on page 12-14 for details.
- **Connected kVA Results:** The Connected kVA Results tab displays connected kVA for de-energized devices. The kVA is calculated based on downstream devices in nominal session. The tab is visible only when the selected device is de-energized.
- **Fault Details:** The Fault Details tab shows fault currents at the selected point in the model. Depending on the conductor selected, data will be displayed for the following fault types:
  - Single Phase Fault
  - Line to Line Fault
  - Three Phase Fault
- **Regulation Settings:** The Regulation Settings tab displays power engineering information for regulation devices, such as shunt capacitors, reactors, regulators/ substation transformers, sources, and distribution generators. The information displayed in the Regulation Settings tab varies by regulation device type.
  - Shunt Devices
    - On Threshold
    - Off Threshold
    - Position

    Note: The **Position** will state either "`on`" or "`off`" depending on the state of the capacitor. When "`off`," the device will show as being open in the NMS model.
    - Automatic Control
    - Regulation Type
    - Measurement Type

        - Operations Count
        - Operations Count Threshold
    - Generators
        - Voltage
        - Angle
    - Distribution Generators
        - kW
        - kVAr
        - Voltage Setpoint
        - Voltage Regulation
        - Status
        - Charge Mode
        - TTL Expiration
        - Wind Speed

    Note: The wind speed of the Distributed Energy Resource's (DER) zone. For a wind DER, it will show the speed of its zone; for other DERs, it will show as N/A.

    - Regulator/Transformer
        - Voltage Setpoint

    Note: If the device is configured for un-ganged regulation each independent phase specific voltage setpoint will be displayed in this column. For devices that are configured for ganged regulation a single setpoint will be displayed.

        - Tap Step

    Note: If the device is configured for un-ganged regulation each independent phase specific tap position will be displayed in this column. For devices that are configured for ganged regulation a single tap position will be displayed.

        - Min Tap Step
        - Max Tap Step
        - LD Comp Z

    Note: Represents the line drop compensation settings that are configured for the regulator or transformer.

        - Tap Side
        - Automatic Control
- **Violations:** The Violations tab shows a list of violations and warnings at the selected point in the model.
- **DMS Settings:** The DMS Settings tab displays DMS settings for the feeder that the device is on; the settings are configured using the Configuration Assistant

Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for information). The DMS Settings tab includes the following information:

- Substation
- Feeder
- PF Mode (hidden by default)
- FLISR
- FLM
- FLA
- Optimization
- Optimization Objective
- Protection Schemes
- Protection Schemes Mode
- Feeder Type (hidden by default)

Note: See **Understanding Column Display Options** on page 1-7 for information on unhiding and hiding table columns.

Viewing Device Attribute Information from the Viewer

You can access attribute information related to a device using the Viewer. Device attributes include physical and reference information about a device, such as location and rating.

To view device attributes from the Viewer, complete these steps:

1. Right-click a device in the Viewer.
2. From the context menu, click **Attributes…**. The Attributes window opens as a dockable pane in the Viewer.

About the Attributes Window

The Attributes window is tabular and allows standard sorting and filtering.

The information in the Device Information is view-only. Once the device attribute window is open, selecting another device in the Viewer will update the information for the selected device.

Understanding Viewer Coloring

When the Viewer is launched, the network model is displayed with Feeder coloring where all conductors fed from a feeder are displayed in the same color. Conditions affecting the network are displayed with highlight coloring, which overlays a glow on the affected network component.

Note: Deenergized highlighting will only appear when customers are affected.

Changing the Coloring Mode

When the Viewer is launched, the network model is displayed in Feeder view where all conductors fed by a feeder are displayed with the same color.

> **Note:** The view indicator is displayed in the Viewer's status bar next to the **Real-Time/Study Mode** indicator.

To change to a different view, select the view from the Viewer's **Options** menu (see **Options Menu** on page 2-51 for details on the different view options). For example, to change to the Phase coloring mode, select **View Phases** from the Viewer **Options** menu.

Viewing the Color Legend

To see the color legend for the view, select **Color Legend...** from the Viewer **Help** menu.

Viewing the Highlight Legend

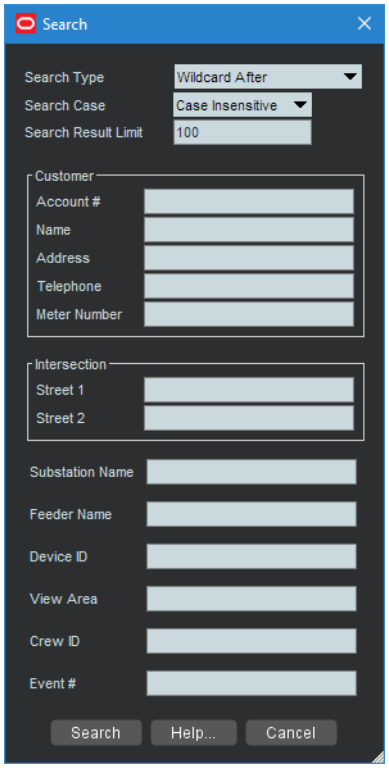
To see the highlight legend for the view, select **Color Legend...** from the Viewer **Help** menu.

> **Note:** De-energized highlighting will only appear when customers are affected.

Searching and Loading Viewer Maps

The Viewer *Search* functionality allows you to quickly focus the Viewer on an area or object.

- Search Type Option
- Search Case Option
- Search Result Limit
- Customer Information Section
  - Account #
  - Name
  - Address
  - Telephone
  - Meter Number
- Intersection
  - Street 1
  - Street 2
- Substation Name
- Feeder Name
- Device ID
- View Area
- Crew ID
- Event #

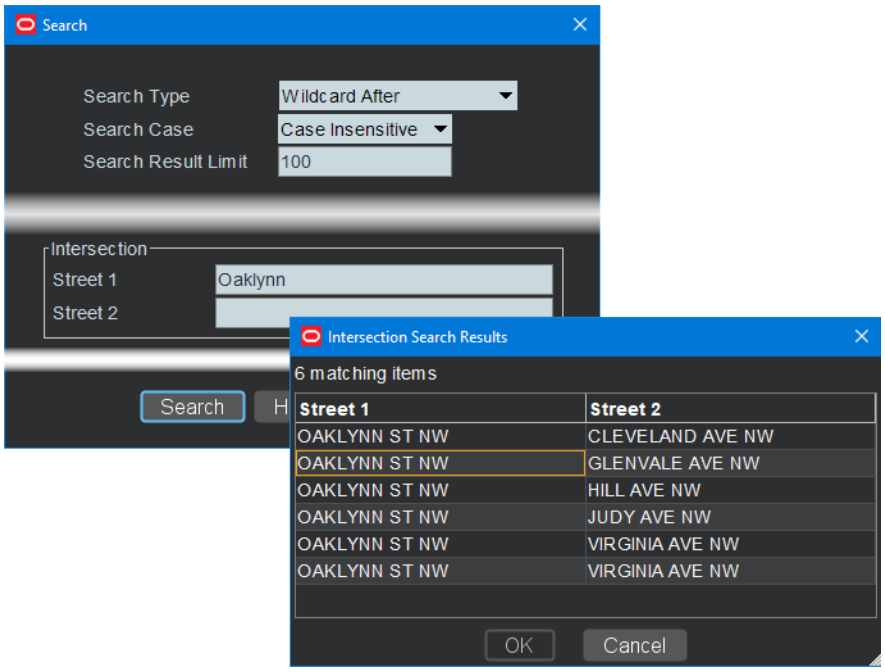


Using the Search Tool to Locate Map Areas and Objects

To locate a particular area or object in the Viewer, complete these steps:

1. Click the **Search** button on the Viewer toolbar or from the Actions menu. The Search dialog box opens.
2. Select the **Search Type** you wish to perform (Exact Match, Wildcard Before, Wildcard After, Wildcard Before and After, Soundex) from the **Search Type** option menu.
3. Select the **Search Case** option you wish to use (Case Insensitive, Case Sensitive) from the **Search Case** option menu.
4. Enter your search result limit in the **Search Result Limit** field (default value is 100).
5. Click the desired search field and either enter search criteria **or** leave the field blank to return all possible values (up to the search result limit).
6. Press **ENTER** or click the **Search** button.
7. If there is *only one match*, the Viewer will shift focus to the search result. If there are multiple matches, a Search Results dialog box displays the search results and the Search dialog box closes.

For example, an **Intersection** search using the term Oaklynn returns six matches.



8. If there are multiple matches, select a row in the Search Results dialog box and click the **OK** button. The object appears centered in the Viewer and the Search Results dialog box closes.

   Note: If none of the results are what you wanted, click **Cancel** in the Search Results dialog box. The Search Results dialog box closes and the Search dialog box is redisplayed.

Loading and Unloading Viewer Maps

Once you have located an area or object using the Search dialog box, you can navigate to an adjacent area where the maps are not yet loaded. From here, you can load all the maps that should appear in the drawing area.

To load maps, do one of the following:

- Select **Load Maps** from the **Actions** menu.
- Press the **M** key.
- Click the **Load Maps** button ( ) on the toolbar.

To unload all maps (not just those in the visible drawing area), do one of the following:

- Select **Unload Maps** from the **Actions** menu.
- Press **Shift+U**.
- Click the **Unload Maps** button ( )on the toolbar.

  Note: Unless your system is configured to unload maps with each focus, any loaded maps will continue to be loaded until you explicitly unload

maps or you switch mode (that is, from study to real-time or from real-time to study).

If there are more devices displayed than the configured maximum, which is 500,000 in the product configuration, the viewer will unload the maps that have the oldest access time to get the total under the limit.

Navigating in the Viewer

There are a number of ways to navigate (pan and zoom) in the Viewer drawing area:

- Use keyboard shortcuts. See **Navigate Menu** on page 2-49 for the available keyboard shortcuts.
- Use the Pan and Zoom Control. You can show or hide the control by selecting or deselecting, respectively, the **Navigate** menu's **Show Pan and Zoom Control** check box.
    - Pan left, right, up, down, or diagonally in the map using the pan compass.
    - Use the Plus (**+**) and Minus (**-**) buttons on the zoom slider to zoom in and out. You can also drag the zoom slider toward the **+** to zoom in or toward the **-** to zoom out. The scale indicator displays the current zoom scale. The scale is hidden if a schematic view, such as a substation, is selected.
- Navigate using your mouse controls, as described in the next section.

Navigating Using Mouse Controls

There are various mouse controls you can use to navigate within the Viewer. The following table shows the Viewer's mouse commands.

To…	Do this…
Select an object	Click the object.
Select multiple objects	Shift-click and drag to extend the selection rectangle around the area with the object you want to select. The **Select a Device** dialog box will open listing all of the devices in the selection area.
Box Zoom	Box Zoom allows you to focus on an area. Click and hold the middle mouse button to begin drawing the rectangle and release it to complete drawing the rectangle; the Viewer will display the area selected at a zoom level that allows the area to fill the Viewer drawing area.
Zoom out	Scroll upward with the scroll wheel, if available.
Zoom in	Scroll downward with the scroll wheel, if available.
Open the Control Tool	Double-click the object.
Move the map	Click and drag the map to a new location.
Flick map	If you drag in the Viewer drawing area while pressing the left mouse button and then release the mouse button (while in the dragging motion), the Viewer map will continue to move in the direction you were dragging (for a bit).

Scaling Symbols and Text

To make the symbols for disconnects, breakers, and conditions prominent while zoomed out, select **Symbols Bigger** ( ) from the Viewer's **Actions** menu. The symbols remain large even as you zoom out, but will still disappear at standard Declutter levels. Conversely, you may make the symbols smaller by selecting Symbols Smaller ( ).

To make text annotations, such as device ID, phase indicator, and so on, larger, select **Text Bigger** ( ) from the Viewer's **Actions** menu. To make text smaller, select Smaller Text ( ).

To reset symbols and text to their standard sizes, select **Reset Size** ( ) from the Viewer's **Actions** menu.

Displaying Pointer Coordinates

To view the coordinates of a point in the Viewer, click and select Pointer Coordinates... from the Viewer's **Actions** menu. The Pointer Coordinates dialog box will open with the following information:

- **Window X/Y:** the position in the current drawing area view.
- **Coordinates (X/Y) (Geographic Coordinate System)**
- **Latitude/Longitude**
- **Distance from Previous Coordinate (Feet)**

Note: The keyboard accelerator (**C**) is very useful for quickly opening the Pointer Coordinates window.

Viewer Focus

The Viewer's **Focus** option is context aware and will function according to your selection.

- If you select an object in the Viewer, clicking the Viewer Focus button will focus on that object.
- If you select an event in the Work Agenda and click the Viewer Focus button, the Viewer will focus on the device/object associated with the event.

Focus on Viewer Selection

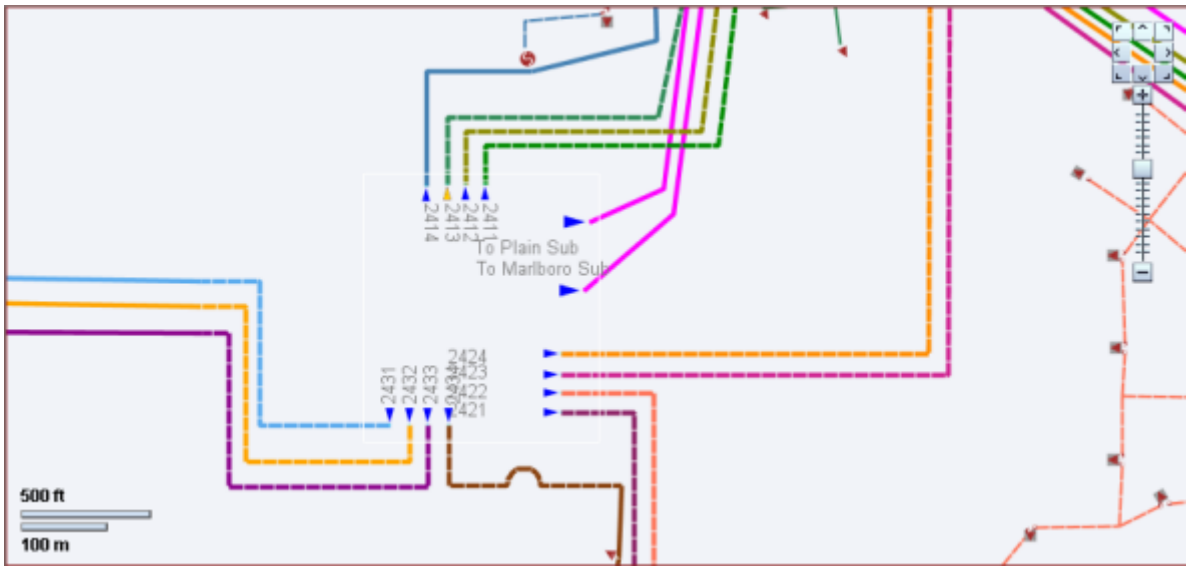
If you select an object in a geographic view in the Viewer and click the Focus button, the Viewer will center the object and zoom in/out as necessary. If the object is part of a substation or internal diagram view, the first Focus action will display the object in the substation or internal diagram view. Each successive click will cycle the Viewer through alternate views, if available, until it cycles back to the geographic view.

If one line feeder schematics or normal schematics are configured, the Viewer **Focus** button ( ) will not include these in the set of maps it focuses on, you will need to click the **Feeder One Line** button ( ) or **Schematic Diagram** button ( ) to navigate to that view.

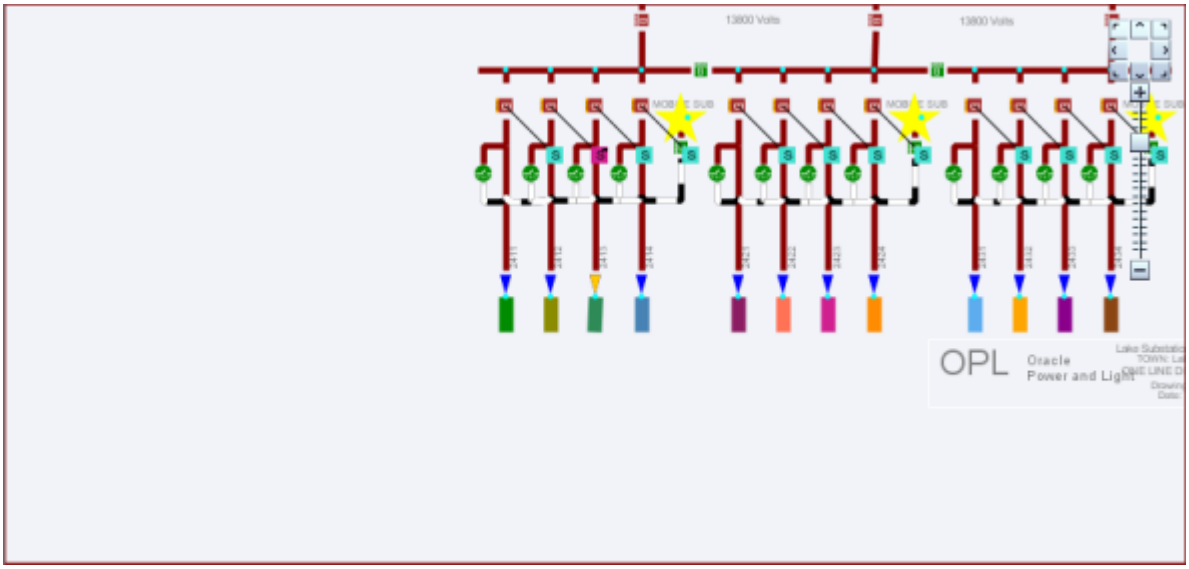
Note: Viewing schematics may not reflect the current (real-time) state of the network since the schematic views are generated by the model build process.

Example: Substation Breaker Focus

1. A substation breaker is selected.

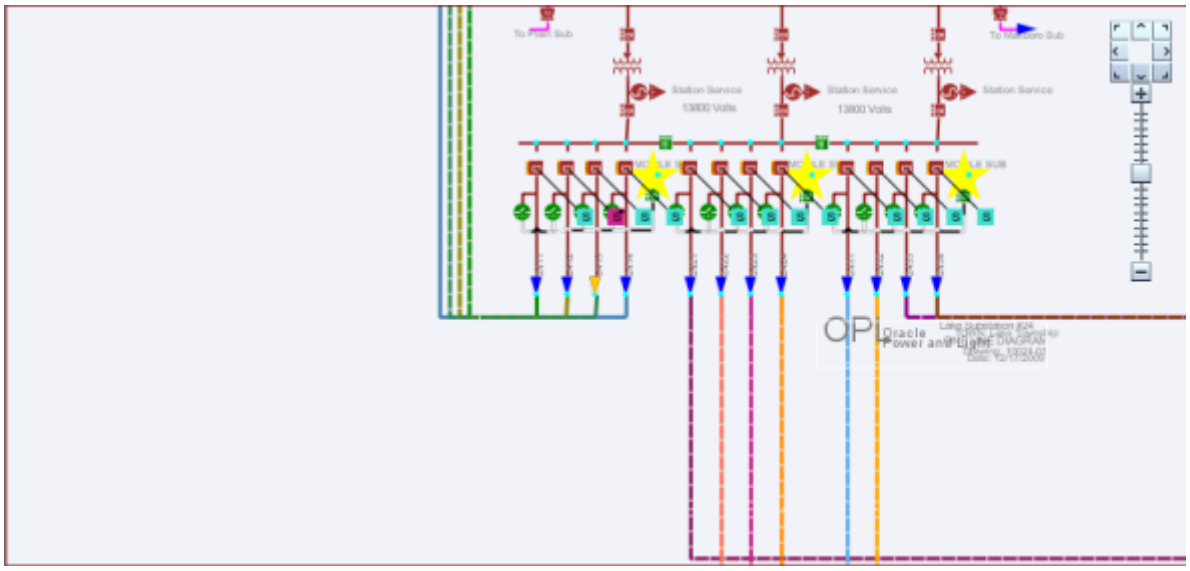


2. Click the **Focus** button ( ); the substation internal view appears.



3. Click the **Focus** button ( ) to return to the original network view.

4. Click the Schematic focus button ( ) and the station schematic view will appear, if one exists, with the device centered in the schematic view.



To return to the geographic view, click the **Focus** button ( ).

Focus on Selection Made in another Window

When you make a selection of an event in another window (for example, the Work Agenda) and click the **Viewer Focus** button, the Viewer will find the device and focus the drawing area on it.

Using Feeder Focus

The Viewer's Feeder Focus feature traces from a selected device back to its feeder breaker and to all downstream devices on the same feeder.

> **Note:** Feeder Focus uses the real-time status or the status from the current study session. It does not display devices that may be part of the feeder in the nominal configuration but not currently part of the feeder.
>
> Feeder Focus should not be used at times of heavy system activity such as those that occur when there are many outages in the system caused by major events and storms.

To use the Feeder Focus feature, complete these steps:

1. Select a device in the Viewer drawing area.
2. Select **Feeder Focus** from the **Actions** menu or press the **F** key (the keyboard shortcut). All symbols disappear except the feeder the device is on.
3. To turn Feeder Focus off and show all the symbols again, press **F**.

Unlike tracing, no other electrical devices are shown except those on the selected feeder. The Feeder Focus will not include de-energized downstream devices. Feeder Focus displays background layers that have been enabled with the Hide/Display dialog box. While in Feeder Focus, you can use Hide/Display, Declutter, and Big Symbols.

Feeder Focus on Adjacent Feeders

To view the feeders adjacent to a feeder in Feeder Focus, select **Change Focus Feeders...** from the Viewer's **Actions** menu. The **Select Feeders to Display** dialog box will open allowing with the list of the feeder in focus and all adjacent feeders.

> **Note:** The current feeder will be highlighted (selected) when the dialog box opens.

From the list, you may:

- Select additional feeders to view.
- Deselect feeders in view; you may remove the initial Feeder Focus feeder.

  Note: Use standard **Shift+click/Control+click** selection methods to select and deselect feeders.

Button Actions

- **Reset:** reselects the last applied feeders in focus.
- **Apply:** updates the Viewer with the selected feeders in feeder focus.
- **OK:** updates the Viewer with the selected feeders in feeder focus and closes the dialog box.
- **Cancel:** closes the dialog box without updating Viewer.

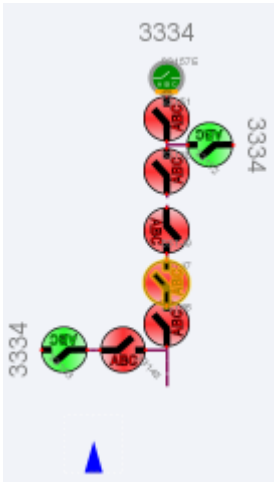
The dialog box will remain open allowing you to change the feeders in focus until you either click **OK** or **Cancel** or remove the Viewer from Feeder Focus mode.

Viewing One Line Feeder Schematics

The Viewer's **Feeder One Line** feature allows you to see one line feeder schematics views.

1. To initiate the feeder one line view, select an object and press **1**.

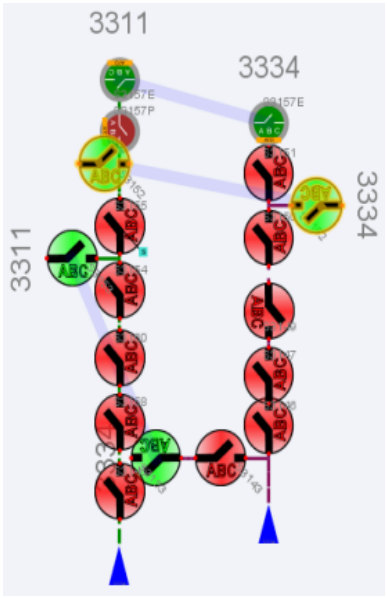
The Viewer will display the Feeder One Line view.



Note: Alternatively, you may select Feeder One Line from the **Actions** menu or click the toolbar button ( ).

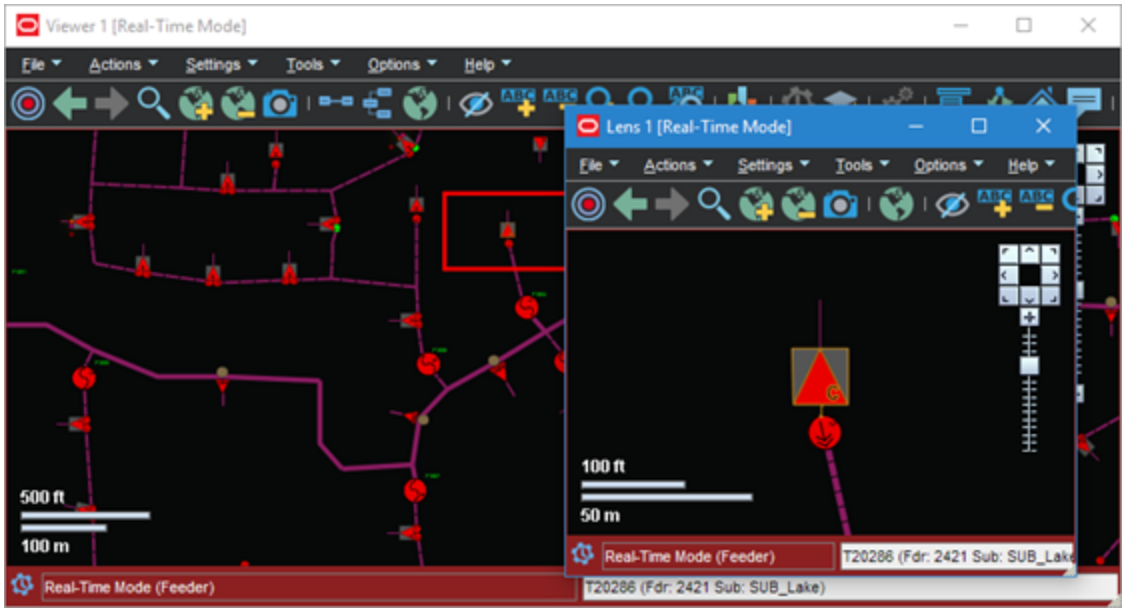
2. To see adjacent feeders in the schematic view, select a tie device in the standard view and press **1**.

The Viewer will display the adjacent feeders schematic with lines highlighted to show the connections.



Using Lens Windows

The Viewer's Lens functionality allows you to start a "mini-Viewer" window that is focused and zoomed in on a selected device. To start a Lens window, select a device in the Viewer and select **Show Lens** from the Viewer's **Actions** menu. The Lens window will open zoomed in on the device.



Behaviors of the Lens Window and Viewer Lens Area

The area displayed in the Lens window is indicated by a red rectangle in the Viewer's Drawing Area. The red rectangle may be moved directly in the Viewer by clicking and dragging. As the rectangle moves, the Lens window will update to show the area inside the rectangle. Likewise, panning and zooming in the Lens window will be reflected by position and size of the rectangle in the Viewer.

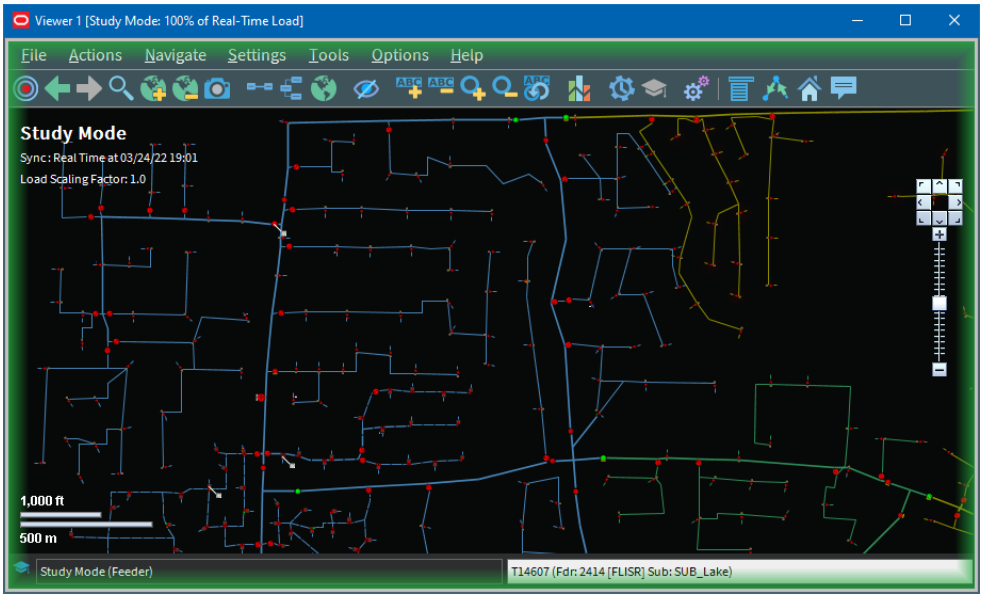
When the Lens is started, its text size, symbol size, attribute size, coloring rule, big symbols, and power flow arrow settings are all synchronized with the Viewer; thereafter, the Lens settings are independent. If you want to resynchronize the Lens settings with the Viewer settings, close and reopen the Lens. Note that real-time/study mode and tracing are always synchronized between the Viewer and the Lens.

Real-Time and Study Mode

NMS applications start in real-time mode, where every action you perform is applied to the real-time model and displayed to all users. Certain windows (the Viewer and the Control Tool) allow you to change to study mode, where your actions are reflected in your study session on your workstation, but not recorded in the real-time model. Study mode is especially useful in "what if" studies, when you need to evaluate the effects of an action before you record it in real-time.

When in real-time mode, the Viewer displays status, topology, and condition information based on real-time operations information. All changes to these items made by any user in real-time mode are reflected on all real-time Viewers in the system.

When in study mode, the Viewer displays only status and topology changes you make on your workstation. Changes made in your study session are not reflected in the real-time model, and likewise changes made in real-time are not reflected in your study session. When in study mode, the Viewer displays information about the study session in the upper left corner of the drawing area and there is a green glow inside the window frame.



A study session is created for a specific workstation the first time you put the Viewer into study mode. The study session is initially created as a copy of the current real-time model. From that point on, changes in the study session and real-time are independent of each other. You can reset the study session to current real-time by using the Study Session Control tool. In addition, some Web Switching Management actions can also cause study session resets. Please refer to the Web Switching Management chapter for more information.

> **Note:** It is recommended that you reset study sessions to real-time as often as makes sense (for example, when starting a new switching plan, testing a new 'what if' scenario, and so on). This is especially important during high load periods (for example, a storm).

Switching to Study Mode

To toggle the Viewer to study mode, do one of the following:

- Select **Study** from the **Options** menu, or

- Click the study mode button ( ) on the toolbar.

The Viewer window borders change color to gray.

- You can reset the study session to either the current real-time model or the nominal model using the Viewer's **Reset Study Session…** button in the **Options** menu.

Switching to Real-Time Mode

To toggle the Viewer back to real-time mode, do one of the following:

- Select **Real Time** from the **Options** menu, or
- Click the real-time button ( ) on the toolbar.

The Viewer window borders and dialog boxes change color back to red.

Selecting Devices

Device Selection

- To select a single device in the Viewer, click the device symbol. If you are selecting a Viewer area that has multiple objects, it will find the object that is on top using the configured draw order.

Box Selection

Box selection is used to select a device from an area containing multiple devices. To perform a box selection, Shift-click and drag in the Viewer drawing area to create a rectangular selection box. When you release the mouse, the **Select a Device** window opens and is populated with all devices within the selection area. Select any device in the list to highlight it in the Viewer; highlighting changes the device symbology to the selection color, but the device is not selected until a selection action is initiated.

Select a Device provides the following actions:

- **Select** - selects the highlighted device and closes the window.
- **Control Tool** - selects the highlighted device, opens its Control Tool, and closes the window.
- **Device Details** - selects the highlighted device, opens the Device Details window above the device in the Viewer, and closes the window.
- **Cancel** - closes the window. The last highlighted device, if any, will remain highlighted in the Viewer, but will **not** be selected for subsequent Viewer actions.

  Note: Only a single device can be selected at any given time unless the Viewer is in Supply Points mode. See **Graphical Grouping (Supply Points Mode)** on page 3-45 for details.

Polygon Selection

Polygon selection is an advanced form of box selection. To begin a polygon selection, press the Alt key and click the Viewer drawing area to place the first anchor point; continue to press Alt and click to add additional vertices. To complete the polygon, press

Alt and right-click to connect the last vertex to the first vertex. Once the selection polygon is complete, the **Select a Device** window will appear listing all devices that were inside the area.

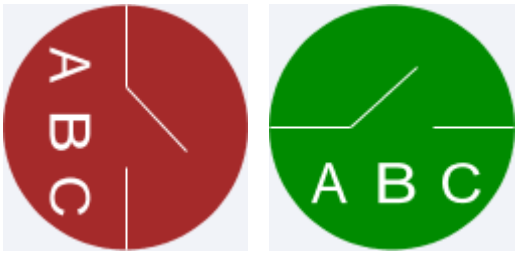
Multiple Selections

If you are in Supply Points mode, you can use Box Selection or Polygon Selection to select multiple supply points. To add a supply point to your selection press the Control key and click the supply point; likewise, to remove a supply point from your selection, press the Control key and click a selected supply point. You may also add multiple supply points to your selection by pressing the Control key while performing a box selection.

Identifying Symbology

Device Symbology

Changes in the status of a device (for example, switches, fuses, breakers, and so on) are reflected by changes in symbology. For example, a closed switch is a different color and shape than an open switch.



Switch in the closed state (left) and open state (right).

Condition Symbology

Dynamic conditions on a device (for example, "predicted service outage," "crew on-site," "notes," and so on) are indicated with specific symbols attached to the device to which the conditions apply.

Condition symbols display in specific areas around a device or object. The following table provides examples of where condition symbols display in relation to the device they are attached to. The following figure displays the Viewer with probable device outage, crew on-site, note and tag conditions.

Area	Symbols
Above Left	Tags
Above Right	Probable Service/Device Outages Real Outages
Below Left	En route/Onsite Crews

Area	Symbols
Below Right	Notes Call Clues

Work Agenda Interaction with Event Condition Symbols

When you select a condition symbol for an event, such as a predicted service outage symbol, the corresponding row in the Work Agenda will be highlighted and the Work Agenda table will scroll to display the row, if necessary. If the event is not in the Work Agenda filtered view, the Work Agenda will not change to a filter that would show the event and the selection will be cleared; for example, if the Work Agenda is set to show completed events, selecting an active event symbol will not change the Work Agenda to the "To Do" view to show the event.

Related

- **Understanding Work Agenda (Filtered) Views** on page 2-30

Conductor Symbology

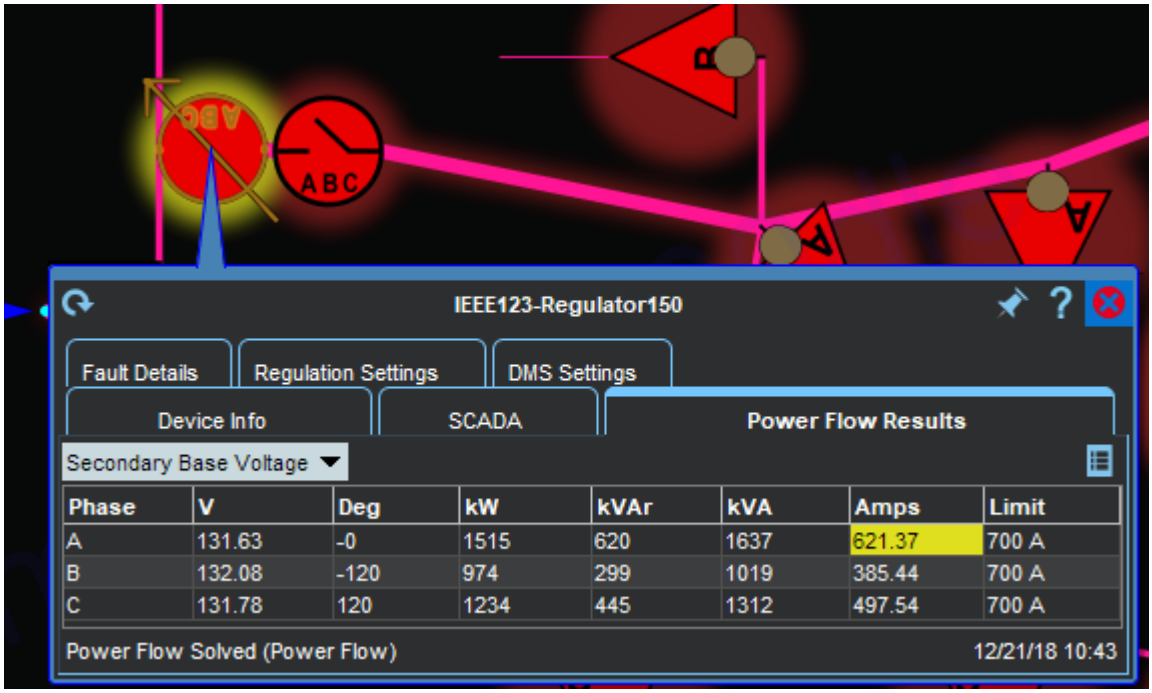
Conductor symbology changes color, dash patterns, and thickness for different types of conductors and topology states.

Symbology	Line Pattern	Color
Overhead Line	Solid	Varies
Underground Cable	Dashed	Varies
Confirmed De-energized	Dashed	Black-White
Partially Energized	Dashed	Black-Grey
Predicted De-energized	Dashed	Feeder Color-White
A Phase	Thin	Red
B Phase	Thin	Yellow
C Phase	Thin	Blue
Loop	Magenta	
Parallel	Purple	

Violation and Warning Symbology

Objects in the electrical model that are in warning or violation states have a yellow or red glow, respectively.

Example: Switch Warning and Conductor Violation



Device Details provides information about a selected object's warning or violation.

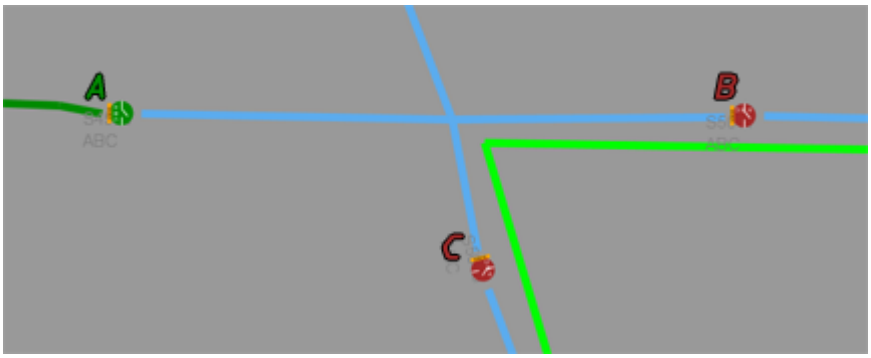
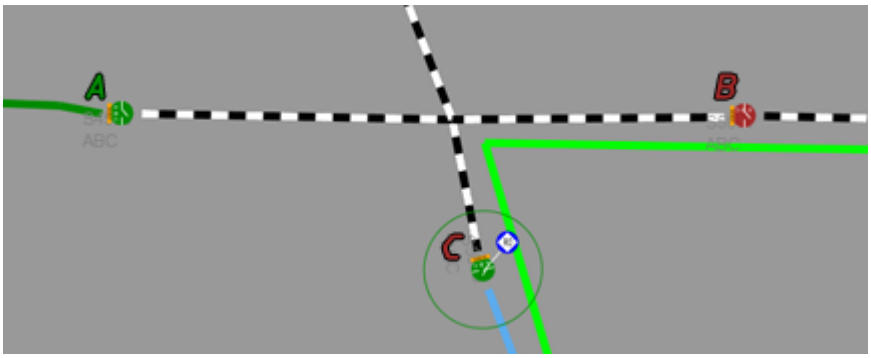
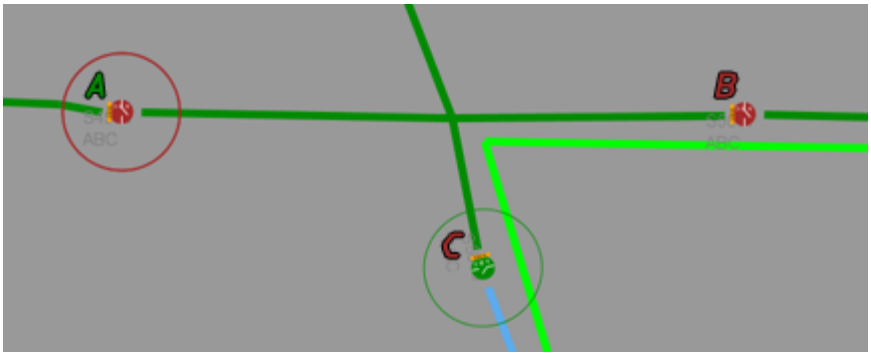
Related

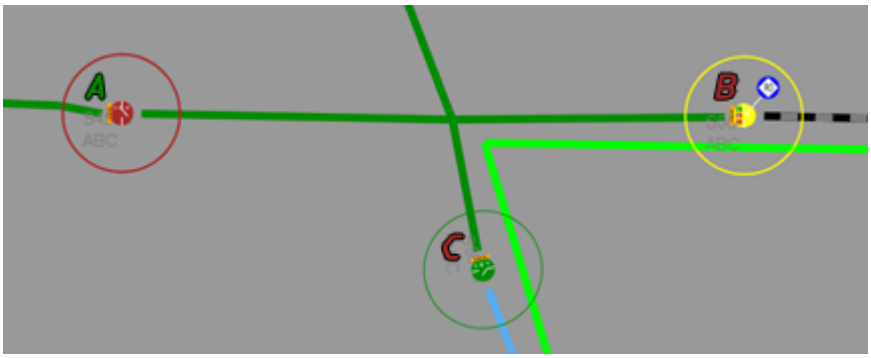
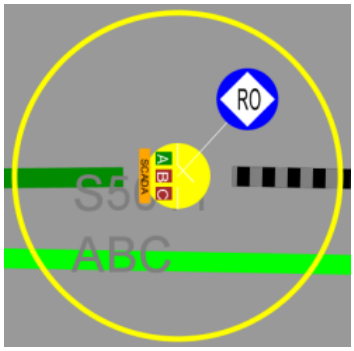
- **Using the Feeder Load Summary** on page 17-4

Note: The colors are configurable so your system may be different.

Off-Nominal (Abnormal) Status Symbology

The table below illustrates how symbology identifies devices in off-nominal (abnormal) states.

Example	Description
	This illustration shows three 3-phase switches (marked A, B, and C) in their normal states. Switch A is normally open; Switches B and C are normally closed.
	When Switch C is opened, an outage is created (indicated by the RO symbol) and the downstream circuit is de-energized. The symbol for Switch C changes from red (closed) to green (open), and a green circle appears around it to indicate that it is abnormally open.
	Switch A is closed to re-energize the circuit. The switch symbol changes to red (closed) and a red circle appears around the switch to indicate that it is abnormally closed.

Example	Description
	Opening a single phase of the normally closed Switch B, causes the device to go into a partially abnormal state, which is indicated by a yellow switch symbol surrounded by a yellow circle. The state of each phase is indicated by a color block behind the phase name. In this example, the A phase is opened and the switch shows the A with a green (open) background; the B and C phases are closed and have red backgrounds.  The downstream circuit is partially de-energized and a real outage (RO) is created.

SCADA Symbology

For systems with SCADA Extensions, the Viewer provides many visual cues about SCADA devices and their statuses. For details on SCADA symbology, see **Understanding SCADA Information in the Viewer** on page 10-24.

Hiding and Displaying Viewer Objects

The Viewer's Hide/Display tool allows you to display only those map elements (for example, layers, objects, crew types) that are of interest to you. To change visibility of components displayed in the Viewer, complete these steps:

1. Click the Hide/Display ( ) toolbar button. (Alternatively, you may select **Hide/Display...** from the **Actions** menu.)
2. Select the elements that you want displayed; deselect those elements that you do not want displayed.

   Note: Hide/Display is a configurable feature of NMS so your dialog box may have different options.

3. Hide/Display options may include:
    - **Layer Groups:** defined groups of single layers listed in the **Layers** pane.
        - Above Ground
        - Underground
        - Transformers
        - SCADA Switches
        - All Electrical
        - Basic Landbase - refers to the display of landbase data from the Map Definition Utility.
    - **Layers**
        - Overhead Conductors
        - Underground Cables
        - Manholes
        - Underground Fuses
        - SCADA Disconnects
        - SCADA Circuit Breakers
        - Other Electrical
        - Supply Nodes
        - Roads
        - Waterways
        - Other Landbase
        - Measurements - refers to SCADA measurements. For more information, see **Understanding SCADA Measurements** on page 10-2.
        - Violations - refers to devices or feeders in a violation or warning state. For more information, see **Using the Feeder Load Summary** on page 17-4.
    - **Highlighting**
        - Predicted De-energized - adds a glow around an object that is predicted to be de-energized.
        - Confirmed De-energized - adds a glow around an object that is confirmed to be de-energized.
        - Distributed Generation - adds a glow around conductors fed (or partially fed) by distributed generation.
        - Powerflow Violations - adds a glow around an object that has a power flow violation.
        - Powerflow Warnings - adds a glow around an object that has a power flow warning.
        - Assessed - adds a glow around conductors that have been marked as assessed.

Note: If more than one highlighting color matches, the following order of importance is used:

1. Violations
2. Warnings
3. Predicted out
4. All other highlighting (following the configured conductor coloring priority).

To see the color legend for highlighting glows, select **Highlight Legend...** from Viewer's **Help** menu.

- **Crew Types**
  - Service & Trouble
  - Tree
  - Line
  - Eval
- Incidents - allows you to choose whether to display all calls or just AMI notifications and whether to display symbols for all damaged assets or only the main asset for each damage report.
  - Show All Calls
  - Show All AMI
  - Show FLA by Default
  - Show All Damage
- Declutter (On/Off) - see **Decluttering the Viewer** on page 2-82 for details.
- Hide Conditions with Devices (On/Off) - see **Hiding Conditions with Devices** on page 2-82 for details.
- Spatial Landbase Menu - allows you to chose which Spatial Landbase to use. The options available will depend on your installation.
  - None
  - Web Map Server 1 Road
  - Web Map Server 1 Aerial
  - Web Map Server 2 Road
  - Web Map Server 2 Aerial
  - Oracle: refers to the display of Spatial Landbase data from an Oracle Locator or Oracle Spatial base map defined using Oracle MapBuilder. MapBuilder is a standalone graphical tool for creating and editing styles, themes, and base maps.
  - Oracle with Outage Summary
- The Network Level menu allows you to choose to display:
  - All Primary (the default)
  - Backbone Only
  - Primary and Secondary

    - Backbone and Laterals
  - The Phases menu allows you to choose to display:
    - All Phases (the default)
    - Multi-Phase
    - 3-Phase Only
  - The Pending Devices menu allows you to choose to display construction pending, decommissioning conditions, and inactive devices. Options are:
    - Hide Pending Devices (the default)
    - Show Pending Devices

4. Click the **Close** button to close the Hide/Display dialog box.

Decluttering the Viewer

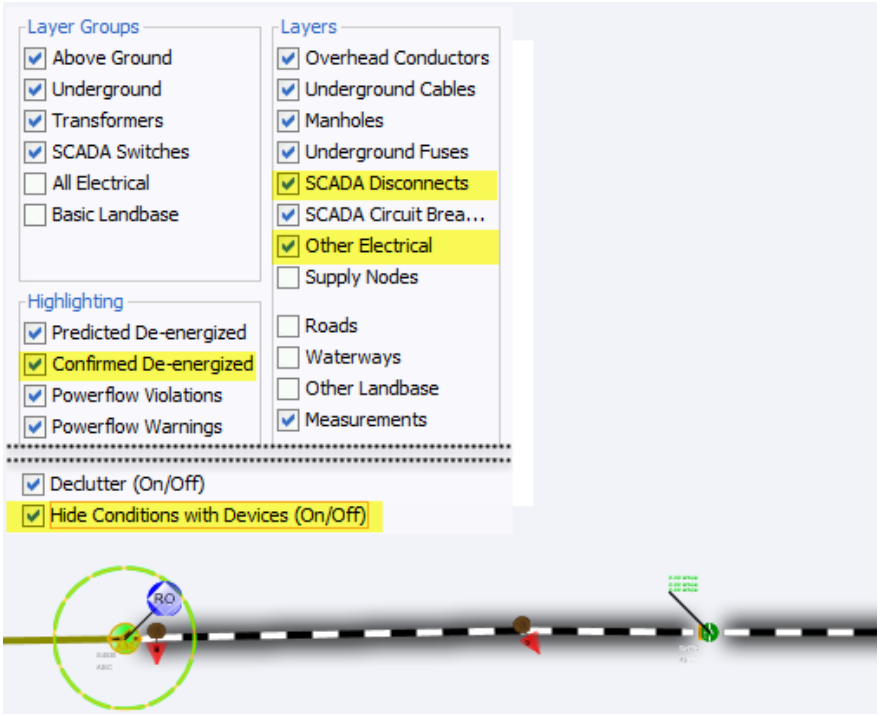
The Viewer automatically hides objects based on predefined declutter zoom levels. This allows you to only see high-level information at higher zoom levels, removing small text and other items that are no longer readable at that zoom level. When an object is decluttered, any associated conditions and text will also be decluttered. The declutter option in enabled by default, but you can turn it off by unchecking the Declutter (On/Off) option in the Hide/Display dialog box.

Hiding Conditions with Devices

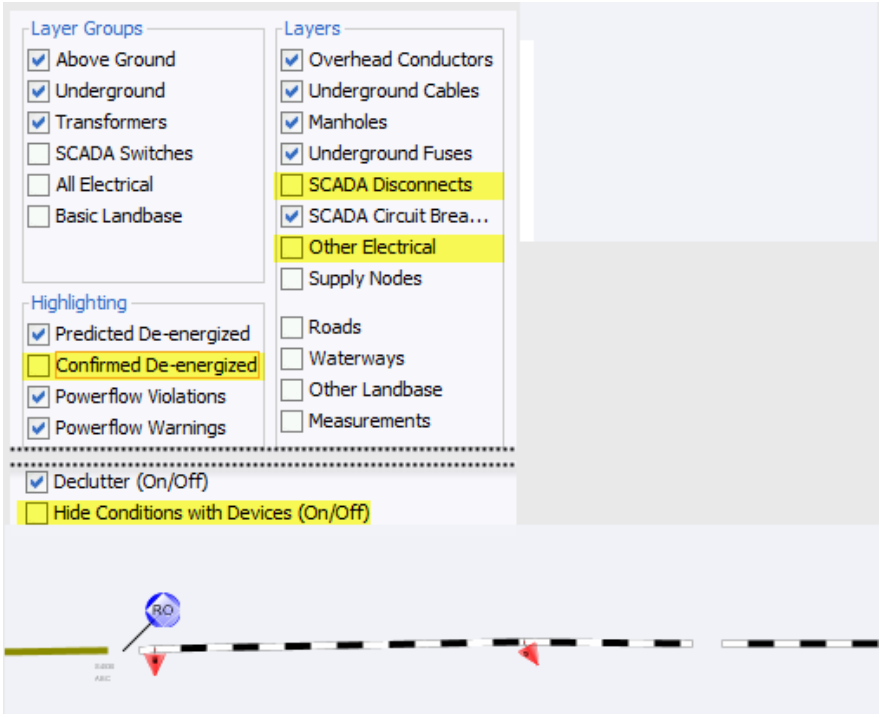
The Hide Conditions with Devices option, which is selected by default, will hide all conditions when their associated devices are hidden, either due to other Hide/Display options or decluttering. When not checked, the conditions will always display, even when their devices do not.

Hide/Display Example

The following example demonstrates hiding two devices, displaying device conditions for a device that has been hidden, and removing highlighting from a conductor.



Unchecking the SCADA Disconnects and Other Electrical layers causes the Viewer to hide the devices; unchecking the Confirmed De-energized hides the black highlighting; unchecking the **Hide Conditions with Devices** option causes the Outage symbol remain visible when the associated device is hidden.



Executing Traces

The trace feature allows you to display the path from a selected device to other devices based on specific criteria. The trace path is displayed on the Viewer by changing all conductors that are part of the path to a thick light blue.

This section includes the following topics:

- Trace Types
- Executing a Trace
- Inspecting Direct Connections and Navigating to Connected Objects

For a description of the fields and buttons on the Trace dialog box, see Using the Trace Dialog Box.

Trace Types

The following table describes the various types of traces.

Trace Type	Description
To Source	Traces from the selected device to its energizing source.
All Connected	Traces from the selected device to all connected devices, stopping only at energizing sources.
To Transformer	Traces from the selected device to upstream and downstream transformers.
To Switch	Traces from the selected device to upstream and downstream switches.
To Device Class	Traces from the selected device to a device class. Click the **Search** button ( ) to open the Select Class dialog box, which displays a tree list of device classes. Multiple device classes can be chosen by holding down the **CTRL** key when selecting additional classes. After making your selection, click the **OK** button to close the dialog box.
To Open Points	Traces from the selected device to all directly-connected open points on the feeder.
To Nominally Open Points	Traces from the selected device to all directly connected nominally open points on the feeder.

Using the Trace Dialog Box

Understanding the Trace Dialog Box Toolbar

Toolbar Icon	Description
	The **Trace** button executes the trace.
	The **Clear** button erases the trace color from the Viewer and returns to normal color.
	The **Refresh** button performs the trace again. This is useful if devices have been operated or the model was rebuilt.
	The **Trace Focus** button focuses the Viewer on the entire extent of the trace.
	The **Endpoint** button focuses the Viewer on the endpoint device of the trace. This option is disabled if the trace is in all directions (since there will not be a single endpoint).
	The **Upstream Impedance Report** button displays a dialog box with all configured upstream devices, their solved voltages, and their modeled impedances. Only available if Power Flow Extensions are licensed. See **Inspecting Impedances with the Upstream Impedance Report** on page 2-89.
	The **Help** button displays online help for the Trace function.

Understanding the Trace Details Pane

To display the Trace dialog box, click the **Trace** button on the Viewer toolbar and select an object. The Trace dialog box displays the following fields and buttons:

- The first drop-down list allows you to select the trace type, as described in the **Trace Type** table above.
- The second drop-down list allows you to select the trace direction:
  - **Upstream:** Constrains the trace to be only upstream of the selected device.
  - **Downstream:** Constrains the trace to be only downstream of the selected device.
  - **All:** Allows the trace to be both downstream and upstream of the selected device.

  Note: Tracing all connected devices will automatically trace both upstream and downstream. Tracing to source will automatically trace upstream.
- The third drop-down list allows you to select the trace mode:
  - **Current Session:** Performs the trace by using statuses currently displayed in the Viewer. This is the default.
  - **Nominal:** Performs the trace by assuming nominal statuses for all devices.
- The fourth drop-down list allows you to select what devices to display in the Trace Results dialog box table:

- **No Table:** The Trace Results dialog box is not displayed.
- **Protective Devices:** The Trace Result dialog box shows devices and fuses along the trace.
- **Switches:** The Trace Result dialog box shows all switches along the trace.
- **Device Class:** Allows you to open the Select Class dialog box to choose one or more classes to show in the Trace Results dialog box; see Using the Select Class Dialog Box for details.
- **All Devices:** All devices along the trace will be shown in the Trace Results dialog box.

- The check boxes enable you to select specific phases to trace. By default, all available phases on the selected object are checked.

Advanced Trace Dialog Box Fields

Click the **Advanced (Expand)** button in the bottom-right corner of the Trace dialog box to display additional information about the selected object, including detailed topology. You can also inspect direct connections and navigate to connected objects.

When you click the **Advanced** button, the Trace dialog box expands to display the following information.

The **Device Details** section displays the following device information:

- Device type
- Device handle
- Network Component Group (NCG)
- Map containing the device
- Display group

The **Symbol Details** section displays the following symbol information:

- Symbology class
- Symbol ID
- Coloring status
- Valid statuses
- Coloring rule
- Symbol coordinates

The **Connectivity Details** section displays the following connection information:

- Feeders
- Current statuses
- Nominal statuses
- Other statuses

The **Connections** section displays a list of connected nodes for the selected object. You can expand the list of connections for each node and focus the Viewer on an object in the list. For more information, see **Inspecting Direct Connections and Navigating to Connected Objects** on page 2-89.

Executing a Trace

To execute a trace, complete these steps:

1. Select the device you want to trace from and click the Trace button ( ). (See **Using the Trace Dialog Box** on page 2-85 for field descriptions.)
2. Select the trace type, direction, mode, and the phases to trace, as described in the following table:

To trace...	Do this…
To all connected devices	Select **All Connected** from the drop-down list and then click the **Trace** button. The Viewer traces from the device to all connected devices stopping only at an energizing source.
To connected transformers	Select **To Transformer** from the first drop-down list and select the direction from the second drop-down list. Click the **Trace** button. The Viewer traces from the device to all transformers in the specified direction.
To connected switches	Select **To Switch** from the first drop-down list and then select the direction from the second drop-down list. Click the **Trace** button. The Viewer traces from the device to the nearest switch in the specified direction.
To the energizing source	Select **To Source** from the first drop-down list. Click the **Trace** button. The Viewer traces from the device upstream to the energizing source.
To a specific device class	Select "To Device Class" from the first drop-down list. The Device Class field and **Search** button will be displayed. Click the **Search** button to open the Select Class dialog box. Expand the electrical object tree and select the device class that you wish to trace to. Click **OK** to populate the Device Class field. Click the **Trace** button. The Viewer traces to that device class.
A specific phase	Select the phase you want to trace. Select the tracing option (All Connected, To Transformer, To Switch, or To Source) and the direction, then click the **Trace** button.
Upstream	Select either "To Transformer" or "To Switch" from the first drop-down list, and then select "Upstream" from the second drop-down list. Click the **Trace** button.
Downstream	Select either "To Transformer" or "To Switch" from the first drop-down list, and then select "Downstream" from the second drop-down list. Click the **Trace** button.
Both upstream and downstream	Select either "To Transformer" or "To Switch" from the first drop-down list, and the select "All" from the second drop-down list. Click the **Trace** button. (Tracing all connected devices and tracing to the source will automatically trace both upstream and downstream.)
Using statuses currently displayed in the Viewer	Select "Current Session" from the third drop-down list. Select the tracing option (All Connected, To Transformer, To Switch, and so on) and the direction, then click the **Trace** button.

To trace...	Do this…
Using nominal statuses	Select "Nominal" from the third drop-down list. Select the tracing option (All Connected, To Transformer, To Switch, and so on) and the direction, then click the **Trace** button.

Understanding the Trace Results Dialog Box

When you select to see trace results in a table (any selection other than **No Table**), the Trace Results dialog box will be displayed once you click the **Trace** button ( ).

Menus and Toolbar Options

File Menu

Menu Option	Description	Toolbar Icon
Export	Exports the table to a .csv file.	

Help Menu

Menu Option	Description	Toolbar Icon
Trace Results Help	Shows the online help.	

Understanding Data Table Actions

If you double-click a table row, the table will focus the Viewer on the row's device.

If you right-click a table row, you can choose from the following context menu options, if applicable:

- **View...:** Focus the Viewer on the device.
- **Calculate Values:** This will calculate the customer counts and kVA information for the row.
- **Look Ahead...:** Opens the Look Ahead dialog box. See **Using the Look Ahead Dialog Box** on page 2-122 for more information.

Click **OK** to close the Trace Results dialog box.

Inspecting Direct Connections and Navigating to Connected Objects

Use the advanced fields on the Trace dialog box to inspect direct connections and navigate to connected objects.

1. In the Viewer drawing area, select the device you want to trace from and click the **Trace** button.
2. Click the **Advanced** button ( ) in the bottom-right corner of the Trace dialog box. The dialog box expands to display detailed connection information.
3. In the Connections box at the bottom of dialog box, click the + sign to expand a node and display all connection branches.
4. Right-click a connection row and select **Focus** from the context menu. The Viewer focuses on the object and colors it with the specified color. The Trace dialog box displays details for the newly selected object, including a list of its connections. Refer to **Advanced Trace Dialog Box Fields** on page 2-86 for more information.
5. Repeat steps 4 and 5 needed to inspect more connections.

Inspecting Impedances with the Upstream Impedance Report

The Upstream Impedance Report allows you to quickly view the impedances between a selected device and the associated equivalent source object. The types of devices shown in the report are configurable; by default, conductor, power transformer, and equivalent source impedances are displayed.

You may view impedances in a trace path without needing to navigate to each individual object or query the data from the NMS database. This will aid in diagnosing data issues while implementing DMS applications such as Power Flow, Feeder Load Management, Fault Location Analysis, and so on.

To access the Upstream Impedance Report, do the following:

1. In the Viewer drawing area, select the device you want to perform the upstream impedance trace from and click the **Trace** button ( ).
2. From the Trace tool dialog box, click the Upstream Impedance Report button ( ). The trace will be performed and the Impedance Report dialog box will open.

Upstream Device Impedances Table

The Upstream Device Impedances table lists the devices contributing impedance to the network between the selected object and the equivalent source. The devices listed will be ordered with the most upstream device first. However, if the trace encounters a parallel area, the devices in parallel may be listed in any order. Devices in a parallel state are denoted with a check mark in the **Parallel** column and with magenta coloring in the **Order** column.

To see a listed device in the Viewer, right-click the row and select **View...** from the context menu. The Viewer will focus on the device.

> **Note:** Data may be copied from the table (see **Copying Table Data** on page 1-7 for instructions).

Using the Commissioning Tool

The Commissioning Tool allows you to commission a device that is currently in construction or decommission devices currently marked for removal.

To open the Commissioning Tool, select **Commissioning Tool...** from the Viewer's Actions menu. The Commissioning Tool displays two panes:

- The **Waiting for Approval** pane displays a table of devices that need to be approved and indicates their current statuses (To Commission or To Decommission).
- The **Approved** pane displays a table of devices approved for removal and indicates their current statuses (Commissioned or Decommissioned).

If no pending devices are currently selected, both panes will be empty.

The tables may be sorted by either the Device or Status column and may be filtered using the filter fields at the top of the table columns. The status bar at the bottom of the Commissioning Tool window indicates the current real-time or study mode status.

You can perform the following actions on the devices displayed in the Commissioning Tool window:

Task	Description
Approve the selected devices.	Select one or more devices in the Waiting for Approval list and click the approve button ( ); alternatively, you may use the right-click menu option. The devices are moved to the Approved list and their symbols in the Viewer change from red or green to gray.
Focus on the device in the master Viewer window.	Select a single device in either list and click the Focus button ( ); alternatively, you may use the right-click menu option.
Remove selected devices from the list.	Select one or more devices in either list and click the **Remove** button ( ); alternatively, you may use the right-click menu option.
Undo the approval for the selected device.	Select one or more devices in the Approved list and click the **Undo** button ( ); alternatively, you may use the right-click menu option. The devices are moved to the Waiting For Approval list and their symbols in the Viewer change from gray back to red or green.

Commissioning and Decommissioning Devices

To commission or decommission sets of devices, perform the following steps:

1. In the Viewer, load the pending device changes you wish to modify. You can select multiple devices.
2. Enable the **Show Pending Devices** option in the Hide/Display dialog box.
3. Switch to study mode if you don't want to affect the real-time model.
4. Select **Commissioning Tool...** from the Viewer's Actions menu. Selected devices pending approval are listed in the Waiting for Approval pane.

5. Select the devices you want to commission or decommission, then click the **Approve** ( ) button.

Notes:

- Devices being decommissioned are no longer part of the model and are immediately de-energized, as are downstream devices.
- Commissioned devices immediately become part of the model and energization is recalculated (that is, a newly commissioned device attached to an energized conductor will become energized).

Selecting Pending Devices

When you select a device in the Viewer that is pending construction or decommission, the device is listed in one of the panes in the Commissioning Tool. To select multiple objects, shift-click and drag until the selection box surrounds the objects.

> **Note**: Use the **Show Pending Devices** option in the Hide/Display dialog box to display or hide pending devices.

The Viewer displays the following commissioning-related conditions:

Symbol	Description
	Unapproved pending construction.
	Approved pending construction.
	Unapproved pending decommission.
	Approved pending decommission.

Using the Commissioning Tool with Web Switching Management

The Commissioning Tool will generate switching steps for each commissioning/ decommissioning devices action when Web Switching Management is licensed. Commissioning/decommissioning actions will always be recorded in Real-Time mode. The actions will either go into the Miscellaneous Log, Event Details Steps tab, or a switching sheet recording Real-Time operations. The tool recording the commissioning change will be indicated at the top of the Commissioning Tool.

Non-complete Commissioning and Decommissioning steps can be executed over and over again in Study mode within the switching sheet they were recorded into. In Real Time, the steps can only be Instructed and Completed one time which will initiate the action against the Real Time model. Completing the step in study mode will only cause the action to be completed in the user's study session.

For performance purposes, Commissioning and Decommissioning steps should be completed in groups by highlighting multiple steps during step execution operations. This will force the requests to be packaged and processed as a batch request. The batch processing will only work if the Commissioning and Decommissioning steps are contiguous in the steps list without any other type of step mixed in. You can still highlight a larger group of steps containing a mixture of step actions and execute them, but each contiguous group of Commissioning and Decommissioning steps will be processed as a batch request.

An error will be generated when completing a commissioning/decommissioning step where the device has not been setup for commissioning or decommissioning. This error will cause the step to not complete and will halt step execution.

A warning scenario will be generated when completing a commissioning/ decommissioning step where the resulting action has already been applied to the device in question. The user will have the option of ignoring the warning, which will cause step execution to continue. If the warning is not ignored, then step execution will be stopped.

Using the Assessment Tool

The Assessment Tool allows you to mark conductors as assessed and clear the assessment mark on conductors that should not be marked as assessed.

To open the Assessment Tool, select **Assessment Tool...** from the Viewer's **Tools** menu.

The Assessment Tool displays two panes that provide the status of selected conductors:

- The **To Assess** pane displays conductors that are not marked as assessed.
- The **Assessed** pane displays conductors that have been marked as assessed.

  Note: If you have not selected any conductors prior to launching the tool, both panes will be empty.

Launching the Assessment Tool

1. Enable the **Assessed Highlighting** option in the Hide/Display dialog box. See **Hiding and Displaying Viewer Objects** on page 2-79 for information on using Hide/Display.
2. Select **Assessment Tool...** from the Viewer's **Tools** menu.

Assessment Tool Toolbar Button Actions

Action	Pane	Toolbar Button
Mark a conductor as assessed. See Marking Conductors as Assessed for details.	To Assess	
Remove the assessed status from conductors. See Removing the Assessed Status from Conductors for details.	Assessed	
Focus the Viewer on a selected conductor.	To Assess, Assessed	
Remove conductors from the list. See Removing Conductors from the Lists for details.	To Assess, Assessed	

Note: All of the toolbar button functions are available from right-click context menu options when conductors are selected in a list.

Marking Conductors as Assessed

To mark conductors as assessed, perform the following steps:

1. In the Viewer, select the conductors that you want to mark as assessed. The selected conductors will be added to the **To Assess** pane.

   Note: You can select multiple conductors.

2. Select one or more conductors in the **To Assess** list and click the **Assessed** button ( ) in the toolbar. The conductors are moved to the **Assessed** list and they receive the assessed highlight color in the Viewer.

Removing the Assessed Status from Conductors

To undo the assessment status, select one or more conductors in the **Assessed** list and click the **Undo** button ( ). The conductors are moved to the **To Assess** list and their highlight color is removed.

Removing Conductors from the Lists

To remove one or more conductors from either the **To Assess** or the **Assessed** lists, select the conductors in the list and click the **Remove** button ( ).

Using the Save Case Management Tool

A study session 'Save Case' is the collection of changes made during a study session. The Save Case Management tool displays a table with rows for any existing save cases. The tool allows you to create a new save case containing the changes made during a current study session or, like resetting your study session to Real-Time or Nominal mode, you may set your study session based on an existing save cases.

Note: Only topology changes are included in a save case.

Opening the Save Case Management Tool

If you are creating a new save case, you would perform device operations prior to opening the Save Case Management tool. Conversely, if you want to start a study session based on an existing save case, you would not want to perform any device operations because the model will be reset to the topology as it existed when the save case was created.

To open the Save Case Management tool, do the following:

1. Start a Study Session. See **Real-Time and Study Mode** on page 2-73 for more information.
2. From the Viewer's **Options** menu, select **Study Mode**, and then select **Save Case Management...**.

   Note: This option is also available from the Web Switching Steps tab's **Reset** context menu.

Save Case Management Tool Menus and Toolbar Options

File Menu

Option	Description	Toolbar Button
Print	Displays the Print Preview dialog box, which allows you print the Save Cases table.	
Exit	Closes the Save Case Management tool.	

Actions Menu

Option	Description	Toolbar Button
Save Case Details...	Displays the Save Case Details dialog box with the save case details for the selected row.	
Reset	Real-Time: resets the current study session to the real-time model.	
	Nominal: resets the current study session to the nominal model.	
	Selected Save Case: resets the current study session to the save case for the selected row.	
Save...	Opens the Save Case Details dialog box with the steps from the current study session.	
Delete...	Displays a confirmation dialog box before deleting the selected save case.	

Help Menu

Option	Description	Toolbar Button
Save Case Help	Opens the Oracle Utilities Network Management System's online help content for the Save Case Management tool.	--

Save Case Management Tool Data Fields

The Save Case Management tool's table contains the following information:

The **Save Case Name** field displays the name of the save case.

- The **Description** field displays a description added to the save case.
- The **User** field displays the name of the user who created the save case.
- The **Created Date** field displays the date when the save case was saved.

- The **Base** field displays the model that the save case was created against.

Creating a New Save Case

To create a new save case, you will first perform operations in study mode and then open the Save Case Management tool.

1. In the Save Case Management tool, click the **Save...** button ( ) to open the Save Case Details dialog box.
2. Enter a name for the save case in the **Save Case** field.
3. Enter a description for the save case.
4. Click the **Save** button to save the save case.

   Note: If a row was selected in the Save Case Management tool's Save Cases table, the **Save Case** and the **Description** fields will be populated with the name and description of the selected save case. If you click **Save**, an Overwrite Save Case? dialog box will ask you if you want to overwrite the save case with the operations in your study session.

   - Click **Yes** to overwrite the save case.
   - Click **No** to go back to the Save Case Details dialog box and enter a new name and description.

   If you select a row in the Save Case Management tool, but want to create a new save case, click outside of a table row to deselect the row.

Understanding the Save Case Details Dialog Box

The Save Case Details dialog box contains fields, buttons, and a data table listing the operations performed in a study session.

Save Case Details Fields

The Save Case Details dialog box contains the following fields and buttons:

- The **Save Case** field allows you to enter a name for the save case.
- The **Description** field allows you to enter a description for the save case.

Save Case Details Buttons

- The **Save** button saves the save case with the name entered in the Save Case field. The button is only sensitized when a name has been entered.
- The **Help...** button launches online help for the Save Case Management tool.
- The **Cancel** button closes the dialog box without saving any changes.

Save Case Changes Table Fields

The current study session's operations are listed in the **Save Case Changes** table. The Save Case Changes table contains the following information:

- The **Operation** field displays the type of operation performed.
- The **Device** field displays the operated device's ID.
- The **Phases** field displays the phases affected by the operation.

Viewing an Existing Save Case

When you click the **Save Case Details...** button ( ) or double-click in a row in the Save Case Management tool table, the Save Case Details dialog box is displayed in viewing mode.

The save case details are displayed, along with a Reset to Save Case and a Delete button. The Reset to Save Case button resets the current study session to the displayed save case. The **Delete...** button deletes the displayed save case.

Viewing Device Event History

Event History offers a table summary of events for the currently selected device and optionally, all downstream devices. The events are chronologically ordered by start date with the most recent event being first, but can be sorted by any of the other columns by clicking on the column header. You can access Device Event History by selecting **Device Event History...** from the Viewer's right click context menu.

> **Note:** Your system administrator sets up the columns available in the event history table by configuring the `event_history` database view.

Understanding the Select Scope Pane

This pane allows you to define both how many and what kinds of events are displayed, either by filtering the events to be fetched and/or by limiting the number of events fetched.

- **Device Scope:** Defines whether to fetch events for just the current device (default) or for all devices downstream of this device found by a trace.

  Note: If the device is de-energized, a Nominal trace is used to find the downstream devices.

- **Event Status Scope:** Defines whether to fetch all events (default) or only either Completed or Incomplete events
- **Event Type Scope:** Defines whether to fetch all events or only either Outage or Non-Outage events.
- **Max Events To Fetch:** Defines the maximum number of events that match the above scope to fetch. Default is 50.
- **Oldest Event To Fetch:** Defines a time and date limit of how far back to fetch events. Events will be fetched from the current time back to the time/date defined here. Default is *Not Set*.

Understanding the Event History Pane

- The **Event #** column contains the unique number assigned to the event. The event number is also displayed in other Oracle Utilities Network Management System applications in order to track the status of the event.
- The **Event Type** column indicates whether the event is predicted or an actual outage - see **Evt Type** column in the Work Agenda.
- The **Status** column indicates whether the event is predicted or an actual outage. See **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.

- The **Start Time** column contains the date and time when the event was reported to have begun.
- The **Est Restore Date** column contains the date and time when the event is expected to be resolved.
- The **Restored Date** column contains the date and time when the event was resolved. If this field is empty, then the event has not been completed.
- The **Completed Date** column contains the date and time when the event was completed. If this field is empty, the event has not been completed.
- The **Cause** column indicates the **Primary Cause** option selected when the event is completed; this columns will only be filled in for completed events.
- The **Remedy** column indicates the **Remedy** option selected when the event is completed; this columns will only be filled in for completed events.

If you select a row in the table, the context menu allows you to focus the Viewer on the event location or open Event Details.

> **Note:** For some older completed events, the Event Details may not display as the event information may no longer be in the cache.

Understanding Operations Event Note Pane

The **Operations Event Note** field displays notes entered regarding the selected event. These notes may include crew remarks and resolution issues.

Using the Control Tool

The Control Tool lets you perform actions on devices. It is typically brought up from the Viewer, although it can also be brought up from an event in the Work Agenda window. The actions you can perform on devices include tagging a device, placing a note on a device, repredicting an outage upstream or downstream from a device and opening and closing a device.

Control Tool topics include:

- Understanding the Control Tool
- Highlighting Events in the Work Agenda
- Tagging Devices
- Placing Grounds
- Disabling Automatic Throwover (ATO) Switches
- Highlighting Events in the Work Agenda
- Viewing Documents Associated with a Device
- Viewing Associated Customers
- Adding Notes
- Viewing Device Attribute Information
- Toggling Call Display
- Viewing Associated Customers
- Placing Jumpers
- Creating Momentary Outages
- Using the Look Ahead Dialog Box
- Associating Documents with Devices
- Associating Damage Assessments to a Device
- Completing and Instructing Actions

For related topics, see also:

- **Using SCADA Control Tool Features** on page 10-28
- **Web Switching Management** on page 11-1
- **Working with Safety Documents** on page 11-102
- **Using the Training Environment Control Tool** on page 25-4

Understanding the Control Tool

The Control Tool lets you perform device operations based on the current status of the device. For example, if a device is already open, you can close it. If the device is closed, you can open it. You can operate all or some of the phases of a device (if the device is a multi-phase device).

You can access the Control Tool from the Viewer by double-clicking a device or by selecting a device and then clicking the **Control Tool** button () on the Viewer toolbar. If you click the Viewer drawing area without selecting a device, the system selects the nearest device.

The name of the device and its type are displayed at the top of the Control Tool. When operating in Real Time with Web Switching enabled, the tool recording the steps will also be displayed at the top of the Control Tool. Tools that record steps include Switching Sheets, Standalone Safety Documents, Event Details Steps tabs, and the Miscellaneous Log. The recording tool label will be hidden in Study mode if no tool is actively recording Study actions.

The left side of the Control Tool provides a set of buttons with options that you can perform; the options that appear differ depending on the type of device that the Control Tool was opened from (pipe, valve, pump, cable, conductor, transformer, fuse, and so on).

Control Tool Actions

Control Tool operations and functions are performed by clicking their corresponding buttons. The following table describes common Control Tool buttons and the actions that they perform.

Option	Description

Operate...	Allows you to perform device operations; options available depend on the device, device state, and whether it is part of a set of devices:
	• Open
	• Close
	• Instruct Open
	• Instruct Close
	• Open and Tag
	• Instruct Open and Tag
	• Remove Tag and Close
	• Instruct Remove Tag and Close
	• Inhibit Topology
	• Un-Inhibit Topology
	• Inhibit All
	• Un-Inhibit All
	• Undo Open
	• Secondary Device Actions
	  • Open Backfeed
	  • Instruct Open Backfeed
	  • Close Backfeed
	  • Instruct Close Backfeed
	  • Open Main & Close Backfeed
	  • Instruct Open Main & Close Backfeed
	  • Open Backfeed & Close Main
	  • Instruct Open Backfeed & Close Main

Phase Wire Down	Inserts a wire down condition into the model.
Put Up Wire	Removes wire down condition from the model.
Cut Cable	Inserts a cut cable condition into the model.
Repair Cable	Removes a condition from the model.

Option	Description
Tag...	Allows you to Place Tag, Instruct Place Tag, Remove Tag, and Instruct Remove Tag.
Ground...	Allows you to Place Ground, Instruct Place Ground, Remove Ground, and Instruct Remove Ground.
Model Edits...	Allows you to select a type of jumper to place. See **Placing Jumpers** on page 2-117.
Optimization...	Allows you to enable or disable optimization for that device.
Regulation Device...	Allows you to display the Regulation Device Parameters dialog box for the selected Shunt Devices, Distributed Generator, Equivalent Source, or Transformer. The dialog box allows you to change regulation device parameters and can be invoked from the Control Tool or Feeder Load Management Details for applicable devices. The dialog box has the additional advantage of allowing you to submit manual entries for SCADA measurements or send the instruction to SCADA, if available. **Note:** The option to adjust regulation settings for **Equivalent Sources** will only be present while in study mode. These devices represent pseudo points in the model and it would not be realistic to adjust these in a real-time setting. In study mode, a user will have the ability to alter the settings to try "what-if" scenarios and see how changes would affect the model.
Fault Current...	Displays the Fault Current dialog box to allow you to change the fault current for the feeder. See **Manually Entering Fault Current from the Control Tool** on page 19-9.
Change Load...	Change Load has two options: • **Change** - Displays the Change Load Dialog to allow you to change the total load for a particular device in your study session. Only available in Study Mode. • **Revert** - Reverts a changed load on a particular device in your study session to its original value.
Highlight Event	Displays the event in the Work Agenda. You must have the correct view of the Work Agenda window open in order to see the highlighted event (for example, the In Progress list).
Repredict Upstream	Allows you to manually repredict the outage to the next predictable upstream device.
Repredict Downstream	Allows you to manually repredict the outage to downstream predictable devices.
Repredict to Here	Allows you to manually repredict downstream outages to the selected device.

Option	Description
Repredict PMO to Here	Allows you to manually repredict downstream momentary outages to the selected device.
View Documents...	Allows you to view documents associated with device.
Note...	Allows you to place notes on devices.
Attributes...	Displays the Device Attributes window, which lists information about the selected device's properties. See **Viewing Device Attribute Information** on page 2-107.
Line Catalog Info...	Displays the Line Catalog Information dialog box, which displays the power engineering characteristics for a selected conductor. See **Line Catalog Information** on page 12-8. **Note:** This option is only available when Power Flow Extensions are licensed.
Damage Assessment…	Opens the Damage Assessments window, which displays a list of damage assessments associated with the device selected in the Viewer and allows you to add new damage assessments. See **Using the Damage Assessments Tab** on page 3-24.
Assessment...	Allows you to place assessment conditions on the device. • **Quarantine:** The quarantine assessment means that the area downstream is quarantined. Current and future events on all downstream devices will go into the *QUAR* (Quarantine) work queue. • **Start Patrolling:** The area downstream should be flagged as needing patrolling. Events will receive the *PTRL* work queue. • **Device Assessed:** This device was assessed. • **Assessed Downstream:** The area downstream has been assessed.
Toggle Call Display	Toggles the call display on or off. When enabled, a symbol is displayed in the Viewer window for any transformers that have calls associated with the event. This option is only available on Control Tools that are opened from a predictable outage device, such as a switch or fuse, which has an open associated event.
Customer List...	Displays the customers downstream from a device.
AMI Customer List...	Displays meters downstream from a device.
Switching Plans...	Allows you to open a switching plan associated with the device. If multiple plans are associated with the device, the Device to Sheet Operation List displays a list of switching sheets and associated operations. Each operation represents a step in the switching sheet. Select a sheet operation and click **Open**. See **Web Switching Management** on page 11-1 for more information on using Web Switching Management.

Option	Description
Generate Steps...	Allows you to generate a set of steps in the active switch sheet to either *isolate* or *tag* the selected conductor. These steps will appear in new **Isolate** or **Place Tags** step blocks, respectively. Sub-options allow you to ignore devices with certain conditions on them.
Safety Documents...	Allows you to open or create safety documents associated with the device. See **Opening Existing Safety Documents** on page 11-121 or **Creating a New Safety Document from the Control Tool** on page 11-136.
Device Violations History...	Displays the Device Violations History on the selected device. See **Device Violations History Window** on page 17-24 for more information.
SCADA Summary...	Opens the SCADA Summary window. See **Using the SCADA Summary** on page 10-17 for more information.
Operate Phases	Allows you to operate all or specific phases of a device by toggling All or any combination of A, B, and C phases. Any phases not applicable to the device are disabled (for example, the Control Tool for an A phase transformer will have B and C disabled). This option is disabled if the selected device is 'gang-operated.'
Date and Time	Allows you to record the date and time an operation was performed. The field defaults to the current date and time, but you can adjust the date using standard date/time control actions (see **Using Date/ Time Pickers** on page 1-5 for details). The date and time of the operation displays in the Event Recorder window. Note that this will also affect reported outage times.
Help	Displays Control Tool help.
Exit	Closes the Control Tool.

Highlighting Events in the Work Agenda

If an event is associated with a selected device, you can find it in the Work Agenda window using the Control Tool's Highlight Event button. You must have the correct view of the Work Agenda window open in order to see the highlighted event (for example, the In Progress list).

> **Note:** If there are multiple events associated with a device, only the first one found will be highlighted. See also **Work Agenda Interaction with Event Condition Symbols** on page 2-76.

Viewing Documents Associated with a Device

To view documents associated with a device, complete these steps:

1. Open a Viewer window. Locate a device that has an associated document you wish to view. (Devices with associated documents have a **"DOC"** condition symbol.)
2. Open the device's Control Tool.
3. Select the Control Tool's **View Documents…** option. The Manage Documents window will open listing any associated documents for the selected device.
4. Select the document and click **View Document**; the document will open for viewing.
5. Click **Exit** to close the Manage Documents window.

For instructions on associating documents to devices, see **Associating Documents with Devices** on page 2-131; note that this function is available only to administrative users.

Adding Notes

The Control Tool allows you to place notes on devices. Notes may be created or opened by clicking the Control Tool **Note...** button, which will open the Notes dialog box. Existing notes for the selected device are listed in the **Notes** pane.

> **Note:** Note text is also displayed in the Device Details balloon (see **Displaying Device Details** on page 2-58)

Notes Dialog Box

The **Notes** dialog box displays the following fields and buttons:

- **Fields**
  - The **Notes** pane contains a table that lists existing notes.
  - The **Edit Log** pane contains a table that lists any previous versions of the selected note that exist.
  - The **Note Text** field displays the text of the selected note.
- **Buttons**
  - The **New** button allows you to enter a new note.
  - The **Edit** button allows you to edit the text of the selected note.
  - The **Delete** button deletes the selected note.
  - The **Help** button launches online help for the Notes dialog box.
  - The **Cancel** button closes the Notes dialog box without saving changes.

Creating a Note

You can create one or more notes for a device using the Control Tool. Once you save a note, a note symbol displays in the Viewer next to the device. If you create multiple notes for a device, the number of notes is displayed in parentheses next to the note symbol.

To enter a note, complete these steps:

1. In the Viewer, open the Control Tool for the device.
2. Click the Control Tool's **Note…** button. The Notes dialog box opens.
3. Click the **New** button.
4. Click the **Note Text** field, and enter the note text.
5. Click **Save**. The note is saved and listed in the **Notes** pane. A note symbol appears in the Viewer next to the device. As notes are added to the device, the number of notes is displayed in parentheses next to the note symbol.

Editing a Note

To edit an existing note from the Control Tool, complete these steps:

1. In the Viewer, open the Control Tool for the device.
2. Click the **Note…** button. The Notes dialog box opens with existing notes listed in the **Notes** pane.
3. Select the note that you want to edit; the note text will display in the **Note Text** pane.

   Note: Any existing previous versions of the note will be listed in the Edit Log table. To see a previous version, select it in the Edit Log table and the note text will be populated in the **Note Text** field. The previous versions are available for reference only.
4. Click the **Edit** button. The **Note Text** pane changes to allow the note text to be edited.
5. Edit the note text as needed.
6. Click **Save**. The note is saved.

Deleting a Note

You can delete a note once it no longer applies to the device or the event.

To delete a note, complete these steps:

1. In the Viewer, open the Control Tool for the device.
2. Click the **Note…** button. The Notes dialog box opens with existing notes listed in the **Notes** pane.
3. Select the note that you want to delete.
4. Click the **Delete** button. The note is deleted from the Notes dialog box.
   - If the deleted note was the only note for the device, then the note symbol disappears from the Viewer.
   - If there is one note remaining, the number of notes displayed in the Viewer is removed.
   - If there are two or more notes remaining, the new number of notes is displayed in the parenthesis.

Viewing Device Attribute Information

You can use the Control Tool to access attribute information for a device. Attributes include physical and reference information about a device, such as location and manufacturer.

To view device attributes using the Control Tool, complete these steps:

1. Open the Control Tool for a device.
2. Click the **Attributes…** button. The Attributes window opens as a dockable pane in the Viewer.

   Note: The information displayed in the Attributes window is variable based on the available data and what your implementation configured to display for a device type.

See also **Viewing Device Attribute Information from the Viewer** on page 2-61.

Toggling Call Display

You can view the calls associated with an event in the Viewer by clicking the Toggle Call Display button. A symbol appears attached to any transformers serving customers that have calls associated with the event. If there were multiple calls with the same "clues" then a number will appear in parentheses next to the call symbol. To hide the symbols, open the Control Tool from the device and click the Toggle Call Display button again.

Viewing Associated Customers

To view the customers on and downstream from a device, click the Control Tool Customer List… button. The Event Details window opens showing the **Trouble Info** tab's **Customers** views, which lists all customers on and downstream from the device.

Note: You cannot change to the **Trouble Info** tab's **Calls** view when you open Event Details from the Customer List option.

If the selected device is de-energized, the list will display all customers downstream from it in the nominal model configuration. From this page, you can initiate a ping request, as well as monitor previous ping results. See **Using the Trouble Info Tab** on page 3-10 for more information.

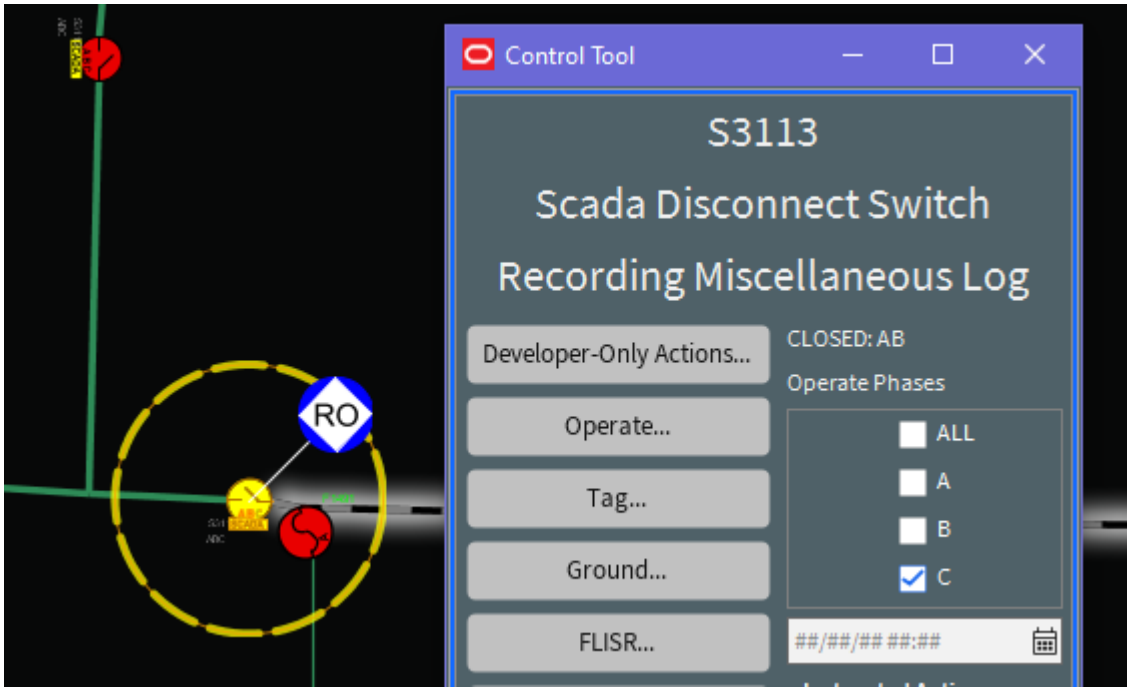
Operating Devices

You can open or close a device in the Viewer to reflect the current state of the device in the field. The Control Tool's available device operation options depend on the status of the device. For example, a Control Tool opened from an open device will only allow you to close the device. In real-time mode, you must have authority over the control zone where the device is located in order to operate the device.

If a device has multiple phases and you only want to open or close one of the phases, you can select which phase you want to operate using the toggle buttons in the Operate Phases section on the right side of the Control Tool.

Note: Phase selection is disabled when the selected device is 'gang-operated'.

The Control Tool's Operate Phases pane displays the phases available for the selected device. A label above the Operate Phases section indicates the phases that are currently closed. For example, in the image below, a three phase switch is shown in the Viewer with the A and B phases abnormally open; the Control Tool shows that the C phase is closed and its Operate Phases pane lists all three phases available on the device.



The Control Tool opens with the **All** phases check box selected whether the device is single phase, two phase, or three phase. You can select one or more phases to perform actions. If you attempt to perform open or close operations on phases that have already been operated, the system will offer to correct the phase selection for you.

Opening a Device

To open one or more phases on a device:

1. Open the Control Tool for a closed device.
2. Select the phase or phases that you want to open. If you wish to open all closed phases, you may leave ALL selected (which is the default).
3. Click **Open**. The selected phases for the device open. If no phase is selected, an error message will be displayed.

Undoing the Open Operation

You can undo an **Open** operation, which is different than closing a device. With the **Undo Open** operation, any RDO that would have been restored will revert back to a predicted outage. As a result, no restore time is set for the associated event and the event remains active.

Closing a Device

To close one or more phases on a device:

1. Open the Control Tool for an open device.
2. Select the phase or phases that you want to close. If you wish to close all open phases, you may leave ALL selected (which is the default).
3. Click **Close**. The selected phases for the device close.

Instructing Actions

Many **Operate** options, such as **Open** or **Close**, will have an **Instruct** version (for example, **Instruct Open**). These do not perform the action in the model, but instead place an Instruct condition in the model, which indicates that another party (usually a crew) has been instructed to perform the action.

Instructed actions display the Look Ahead and other warnings and errors, but, if the action is being recorded in a switching sheet, the Look Ahead and associated errors and warnings display data as if the instructed steps in that sheet were already completed, which allows you to instruct actions in the Control Tool that are dependent upon instructed actions in the current sheet. This will also give you the correct customer count as if the instructed steps were already executed. This considers all instructed steps in the single active sheet only if recording is on and the mode matches the Control Tool's, and then applies them to the model in the order that they were instructed (using the Instructed Date field). The instructed actions can then be completed in the sheet or in the Control Tool's **Instructed Actions** pane.

Instructed Actions Pane

The Instructed Actions pane provides a way of recording results of instructed actions from the Control Tool rather than through a Switching Sheet, Standalone Safety Document, Event Details Steps tab, or the Miscellaneous Log. When an action is instructed, the pane's buttons are enabled so you can record the response.

To record instructed actions results:

1. Open the Control Tool for a device.
2. Click the **Operate...** button.
3. Select an instruct operation, such as **Instruct Open**. The Instructed Actions pane will become sensitized.
4. At this point, the crew would be instructed to open the device and would report back whether:
    - they completed the action
    - they aborted the action
    - the action failed
5. Click the button corresponding to the result.

You may also click the **Show Sheet** button to open an associated Emergency Switching Sheet, Standalone Safety Document (if one exists), active Event Details Steps tab, or the Miscellaneous Log if there is not an existing Emergency Switching Sheet or Standalone Safety Document.

> **Note:** This example assumes a crew is in the field being instructed to perform certain operations. The sequence of events is designed to be

illustrative of the Control Tool actions rather than a suggested workflow for field operations.

Related

- **Emergency Switching** on page 11-90.
- **Using the Miscellaneous Log** on page 11-126.
- **Using Stand Alone Safety Documents** on page 11-137.

Tagging Devices

You can tag devices in the Viewer that are physically tagged in the field. Tags placed on devices in the system prevent users from performing **Open** or **Close** operations on the device. When you place a tag on a device, a tag symbol appears attached to that device in the Viewer. You can place multiple tags on a single device.

> **Note:** You must have authority of the control zone containing the device in order to tag it.

Many tag types can be added by selecting a **Place Tag** option or an **Instruct Place Tag** option in the Control Tool's **Tag...** menu. Certain tag types allow you to add information to the tag prior to placing it; these *editable* tags have an ellipsis (**...**) in their **Place Tag...** and **Instruct Place Tag...** Control Tool options, and will open the Tag dialog box, which contains the editable fields.

Understanding the Tags Dialog Box

The Tags dialog box allows you to create and edit editable tags. The **Tags** dialog box displays the following fields and buttons:

- **Fields**
  - The **Tags** pane contains a table that lists existing tags.
  - The **Edit Log** pane contains a table that lists any previous versions of the selected tag that exist.
  - The **Tag #** field displays the tag's external ID.
  - The **Tag Text** field displays the text of the selected tag.
- **Buttons**
  - The **New** button allows you to create a new tag.
  - The **Edit** button allows you to edit a tag selected in the Tags pane.
  - The **Delete** button deletes the tag selected in the Tags pane.
  - The **Help...** button launches online help for the Tags dialog box.
  - The **Cancel** button closes the Tags dialog box without saving changes.

Placing an Editable Tag

To create an editable tag, complete these steps:

1. In the Viewer, open the Control Tool for the device.

2. Click the Control Tool's **Tag...** button. Select a tag type option where the **Place [Type] Tag** label has an ellipsis. For example, in the NMS standard configuration, yellow tags are editable so you would select **Place Yellow Tag...**. The Tags dialog box will open.
3. In the Tags dialog box, click **New**.
4. In the **Tag #** field, you may (optionally) enter the tag identification number.
5. In the **Tag Text** field, you may (optionally) enter tag text.
6. Click **Save**. The tag is saved and a tag symbol appears in the Viewer next to the device.

Placing a Non-Editable Tag

To place a non-editable tag on a device:

1. Open the Control Tool for the device.
2. Click the **Place Tag** button. A tag symbol displays next to that device in the Viewer.

   Note: When placing a tag from within a switch sheet, the external ID can be edited in the switching sheet column up until the step is completed. The external ID can be edited at the planning stage or be updated at the time of executing the step.

Removing a Tag

To remove a tag from a device:

1. Open the Control Tool for the device.
2. Click the **Remove Tag** button. The Remove Tag dialog box opens, displaying a list of the tags on that device, including when the tag was placed and the user who placed it.
3. Select the row of the tag that you want to remove, and click the **Remove** button. The tag is removed.

Editing Editable Tags

To edit an editable tag type on a device:

1. Open the **Control Tool** for the device.
2. Select the editable tag type from the **Tags...** menu and then select **Place Tag...** or **Instruct Place Tag...** to open the Tags dialog box.
3. Select the tag that you wish to edit in the Tags pane table.
4. Click the **Edit** button. The editable fields will be enabled.
5. Edit the information that you wish to modify and click **Save**.

   Note: Click the **Cancel** button to close the dialog box without saving changes.

Placing Grounds

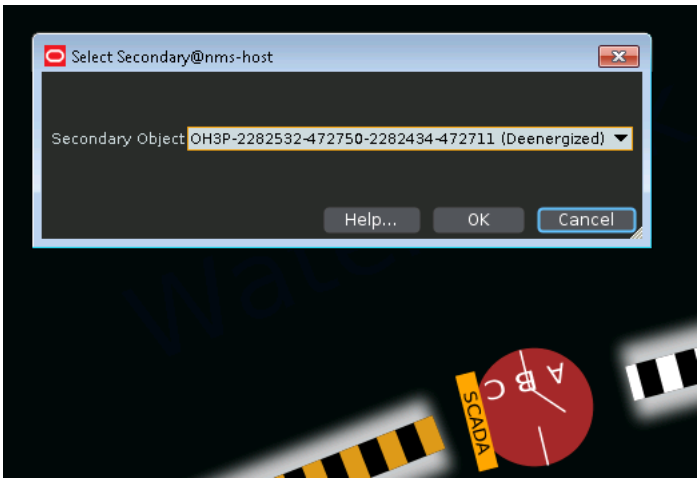
When you open a Control Tool from certain devices or conductors (for example, fuse or wire), the ground function is available. Grounding a device grounds all parts of the circuit connected to the grounding point. The Look Ahead dialog box warns you if the grounding action will create a live, grounded circuit. The grounded circuit is highlighted in the Viewer and indicated by a grounding symbol at the selected device or midpoint of the selected conductor.

Grounding a Device

To ground a device, complete these steps:

1. Open a Viewer window and load the map that contains the device you want to ground.
2. Open the Control Tool for the device.
3. Click on the **Ground...** button and select **Place Ground** from the drop-down list. The Select Secondary Object dialog box will open.

   The Select Secondary dialog box's option list allows you to select a conductor from all conductors attached to the device on the side you want to ground. Once selected, the conductor will be highlighted in the viewer.

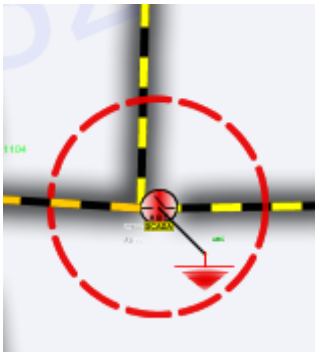


4. Select the conductor and click **OK**.

   If you are grounding a live conductor, the Add Ground Error dialog box opens with a warning: **Danger! This operation would ground a live section.**

   To abort a grounding operation, click **Cancel**.

5. Click **OK** to proceed with the ground. A ground symbol will appear on the device in the Viewer.



Removing a Ground from a Device

You can only remove a ground from the device or conductor on which the grounding was applied. To remove a ground from a device, complete these steps:

1. Open a Viewer window and load the map that contains the grounded device.
2. Open the Control Tool for the device.
3. Click on the **Ground...** button and select **Remove Ground** from the drop-down list. If the device has multiple grounds, a Select Secondary Object dialog box appears.
4. Click on the conductor attached to the device on the side with the ground you want to remove. The alias of that conductor appears in the dialog box.
5. Click **OK**. The grounding symbol is removed from the Viewer.

> **Note:** When removing the last ground on a device that is required by an Issued safety document, a Grounds Check dialog box will be displayed. From the Grounds Check dialog box you have the option of navigating to the Safety Document, continuing with the Remove Ground operation or canceling the operation. For more details, see **Grounds Check** on page 11-116.

Disabling Automatic Throwover (ATO) Switches

The Control Tool for a Primary or Secondary ATO switch provides a function to disable or enable ATO functions. Disabling either ATO switch prevents the system from automatically throwing-over or auto-returning the pair of switches.

Placing a DISABLED Condition

To place a tag on a device:

1. Open the Control Tool for the ATO switch that you want to disable.
2. Click on the **Disable ATO** button. A DISABLED condition will appear on the ATO switch.

The ATO switches can now be operated manually, energization can change, and the system will not automatically operate either ATO switch.

Removing a DISABLED Condition

To re-enable the ATO switch:

1. Open the Control Tool for the disabled ATO switch (that is, one that has the *DISABLED* condition).
2. Click **Enable ATO**. The DISABLED condition will disappear from the ATO switch.

Once both ATO switches are enabled, the system will once again set the ATO switches to their correct positions, based on the energization.

Disabling Network Protectors

ADMS Projects that include the "smart" modeling of network protectors will benefit from power flow results that detect the trip and/or reclose conditions on network protectors. In these scenarios, the ADMS engine will trip or reclose the device as appropriate. However, the Network Protectors can be placed in partially/fully disabled in the field and the NMS supports this through the use of "Manual" and "Disabled" modes.

- In Manual mode, a network protector will only trip, but never reclose.
- In Disabled mode, a network protector will not operate at all.

For SCADA driven Network Protectors, that is those with a SCADA open/close status point, Manual and Disabled modes only affect Study mode behavior and Feeder Load Management forecasts.

For non-SCADA driven Network Protectors - that is those without a SCADA open/close status point; Manual and Disabled modes also affect real-time behavior.

Placing in Manual Mode

To place a network protector in manual mode:

1. Open the Control Tool for the Network Protector switch that you want to update.
2. Click the **Manual/Disable Mode...** button to open the submenu.
3. Click the **Manual Mode NP** button. An "NP Manual" condition will appear on the device. The NP Disabled condition will also be reported in the Conditions Summary window, indicating a manual state.

Placing in Disabled Mode

To place a network protector in disabled mode:

1. Open the Control Tool for the Network Protector switch that you want to update.
2. Click the Manual/Disable Mode... button to open the submenu.
3. Click the **Disable NP** button. A "NP Disabled" condition will appear on the device. The NP Disabled condition will also be reported in the Conditions Summary window, indicating a disabled state.

Restoring to Normal Mode

To place a network protector in disabled mode:

1. Open the Control Tool for the Network Protector switch that you want to update.
2. Click the Manual/Disable Mode... button to open the submenu.
3. Click the Enable NP button. Existing Manual/Disable conditions will be removed. The NP Disabled condition will be removed from Conditions Summary.

The buttons on the submenu will reflect the current status of the device. For example, the **Disable** button will desensitized if the device is already disabled.

The Manual and Disabled modes can also be driven from SCADA measurements. If the device has a SCADA point that indicated it is disabled, for example, then the user options to re-enable a device (or move it to manual mode) will not be available if the device is disabled from SCADA.

Placing Jumpers

In addition to creating an open point, you can insert a jumper on an overhead conductor or between overhead conductors; you can also place emergency cables between underground devices. The jumper is an active part of the model and fully operable. You can open and close jumpers as well as place tags and notes on a jumper.

Model Edits initiated from the Control Tool will be recorded as steps into a switching sheet recording Real Time actions. If no switching sheet is actively recording Real Time actions, then the action will be recorded into the Miscellaneous Log. The actions will also show up in the User Log. If the model edit fails, then the step will be marked as Failed. Model Edit operations can only be initiated from the Control Tool. Web Switching does not support initiating model edits from a switching step.

The Control Tool's **Model Edits...** context menu allows you to select from the following jumper types.

Jumper Type	Description
In-line Jumper	In-line jumpers are placed in line. The position for the jumper is set to "closed" to maintain a continuous conductor. A closed jumper symbol displays at the midpoint of the selected conductor.
P-P Jumper/ Emergency Cable	Point-to-point jumpers are placed between a selected conductor and the same phase on any other conductor. A dialog box allows you to specify the second conductor. You can select the conductor in the Viewer. A point-to-point jumper symbol displays at the midpoints of the selected conductors. The default state for the inserted jumper is "open."
P-P Cross Phase	Point-to-point cross phase jumpers are placed between different phases on two different conductors. The Cross Phase Selection dialog box allows you to select a live phase and the phase to pick up. The Select Secondary dialog box allows you to specify the second conductor. You can select the conductor in the Viewer. A point-to-point jumper symbol displays, connecting the midpoints of the selected conductors. The default state for the inserted jumper is "open."
Inline Cross Phase	Creates an in-line cross phase jumper to correct any mis-modelled phasing. If desired, this can be configured for single and two phase fuses. The user presses this button and is presented with the standard cross phase dialog box. After choosing the live phase, the system traces upstream to find the first object downstream from a device that contains that live phase, then places an inline cross phase jumper between those two devices. This model edit is automatically removed by the system if the map is rebuilt with the corrected phase.
Tap Generator	Tap Generators are used to add an energization point to the model. A Selection Required dialog box allows you to specify the tap location by clicking on the location in the Viewer.

Jumper Type	Description
Temporary Generator	Temporary Generators are similar to Tap Generators, but contain attributes needed to affect the power flow solution. The **Add Temporary Generator...** option opens the Add Temporary Regulation Device dialog box, which allows you to edit these attributes. See **Adding a Temporary Generator** on page 2-120 for details.
Mobile Sub	Mobile Subs are similar to P-P Jumpers, but contain disconnect switches and a power transformer plus attributes needed to affect the power flow solution. The **Insert Mobile Sub...** option opens the Add Temporary Regulation Device dialog box, which allows you to edit these attributes.

Prompt Options

The **Model Edits... Prompt** options (for example, **In-line Jumper Prompt**, **Tap Generator Prompt**, and so on) allow you to enter details about the jumper with the **Enter Model Attributes** dialog box; see **Entering Model Attribute Values** on page 2-120 for details.

Inserting a Jumper

After the crew informs you what type of jumper they will insert, you can make the change in the system. To insert a jumper, complete these steps:

1. Open a Viewer and load the map that contains the conductor where you want to place the jumper.
2. Double-click on the conductor. The **Control Tool** opens.
3. Click **Model Edits...** and select the appropriate option for the type of jumper you want to insert:
    - If you are placing an in-line jumper, the **Model Edit in Progress** dialog box will be displayed.
    - If you are placing a point-to-point jumper or cross-phase jumper, you can optionally press and hold the **Alt** key while selecting coordinates in the Viewer for the jumper path. Continue selecting points until you have chosen your second conductor.
        - To start over, right click to clear the point selections.
    - If you are placing a P-P jumper or emergency cable, the **Select Secondary** dialog box opens. Select another conductor in the Viewer and click **OK**. The **Model Edit in Progress** dialog box will be displayed.
    - If you are placing a point-to-point or an in-line cross phase, the **Select Secondary** dialog box will open. Select another conductor (in the Viewer), and click **OK**. The Cross Phase Selection dialog box opens. Select a phase for each device and click **OK**. The **Model Edit in Progress** dialog box will be displayed.

    Note: The **Model Edit in Progress** dialog box will disappear when the model build is completed. Click **OK** to dismiss the dialog box or move it to the side while performing other operations. The Viewer will then refresh to display the jumper.

Operating a Jumper

Like devices, you can open and close (Disconnect and Connect) jumpers. To open or close a jumper, complete these steps:

1. Open a Viewer and load the map that contains the jumper you want to operate.
2. Double-click on the jumper. The Control Tool opens.
3. Select the desired phases from the Phases pane, then click **Operate...** and select the operation you want to perform (either **Disconnect Jumper** or **Connect Jumper**).

Removing a Jumper

Once a jumper has been removed in the field, you can remove the jumper from the system. This removes the jumper and fully restores the conductor. To remove a jumper, complete these steps:

1. Open a Viewer and load the map that contains the jumper you want to remove.
2. Double-click on the jumper. The Control Tool opens.
3. Click **Model Edits...** and then select **Remove Jumper**. The **Model Edit in Progress** dialog box will open.

Placing/Performing a Tap Edit

To perform a tap edit:

1. Open a Viewer and load the map containing the conductor where you want to place the jumper.
2. Double-click the conductor. The Control Tool opens.
3. Click **Model Edits...** and then select **Tap Generator...**. The Selection Required dialog box will open.
4. Select a location in the Viewer to populate the Tap Location field in the Selection Required dialog box.
5. Click **OK**. The model edit is performed and a new energization point appears in the map at the selected spot.

Adding a Temporary Generator

1. To add a Temporary Generator on a selected conductor, click **Model Edits...** and then select **Temporary Generator...** to open the Add Temporary Generator dialog box.
2. In the Viewer, select a location to place the generator; the Generator Location field will update with the coordinates selected.
3. Choose a generator type from the **Choose Generator** options list.
4. Edit the attributes values in the table, as necessary.
5. Click **OK** to place the generator or click **Cancel** to abort the model edit.

Entering Model Attribute Values

The Enter Model Attribute Values dialog box allows you to edit a set of attributes for the model edit you are placing. The dialog box is opened automatically when you choose a **Prompt** option or you may open it for a Temporary Generator that has been added to the model.

> **Note:** To edit attributes for a temporary generator, select **Edit Attributes...** from the Control Tool's **Model Edits...** menu.

Once you have made changes to the attributes, click **OK** to place the model edit or click **Cancel** to abort the model edit.

Repredicting Upstream/Downstream

You can force the system to manually repredict a predicted outage either upstream or downstream from the current system predicted device. This is typically done when a crew finds that the problem is not at the predicted device.

- If the device is energized, the problem is actually one or more downstream outages.
- If the device is de-energized, the problem will actually be upstream.

Clicking the **Repredict Upstream** button manually repredicts the outage to the next predictable upstream device. Clicking the **Repredict Downstream** button manually repredicts the outage to downstream devices based on outage prediction rules. When repredicting downstream, the system distributes the event to one or more devices. If a specific configuration rule (**regroupAfterManualMoveDownstream**) is disabled, then **Repredict Downstream** will manually repredict the outage to the next predictable downstream device(s) instead of using outage prediction rules. Once a predicted outage is manually repredicted upstream or downstream, it will be made stable (see **Working with Stable Predictions** on page 3-49). Specific configuration rules (**movableAfterManualMove** and **stableAfterManualMove**) can change whether the repredicted outages are made stable or non-movable.

> **Note:** See **Using the Event Management Rules Tab** on page 24-16 for information on how administrative users may set rules.

For example, a crew finds that a predicted service outage (indicated by the "PSO" symbol) at a transformer is not actually where the trouble is located. Using the Control Tool, you can repredict the outage upstream to the switch. When you repredict the outage, the switch displays a **PDO** (predicted device outage) symbol. The original predicted service outage displayed in one of Work Agenda's Trouble Events list windows changes to a predicted device outage located at the switch.

Creating Momentary Outages

You can create a momentary outage by simulating a momentary interruption in the system. Momentary interruptions occur when a recloser operates and does not lock out. The **Create Momentary…** button is only enabled on Control Tools opened from reclosing devices. To create a momentary outage, complete these steps:

1. Open a Viewer and load the map that contains the device that you want to create the momentary outage for.
2. Double-click the device. The Control Tool opens.
3. Adjust the date and time, if necessary.
4. Click the **Create Momentary…** button. A dialog box opens.
5. Enter the number of momentaries. Values between 1 and 100 enable the **OK** button.
6. Click **OK**. The momentary outage displays in the Work Agenda window with a status of *M-CMP*.

Using Aggregate Device Actions

The Control Tool's aggregate device actions operate multiple devices with a single action. These actions are only available when the devices have been modeled for aggregate

actions. When modeled, the Control Tool's Operate... function has a Secondary Device Actions submenu with the aggregate actions.

> **Note:** The actions can still be performed separately when aggregate actions are possible.

Using the Look Ahead Dialog Box

The Look Ahead dialog box provides information concerning the results of performing a requested device operation. The Look Ahead dialog box uses system status and topology tracing to "look ahead" of the requested operation and determine its consequences.

The Look Ahead dialog box displays whenever you attempt to perform an action that would result in the distribution system status or topology changing (that is, a switching operation). Once you have looked at key information in the Look Ahead dialog box, you may perform or cancel the operation.

This section includes the following topics:

- Understanding the Look Ahead Process
- Understanding the Look Ahead Dialog Box

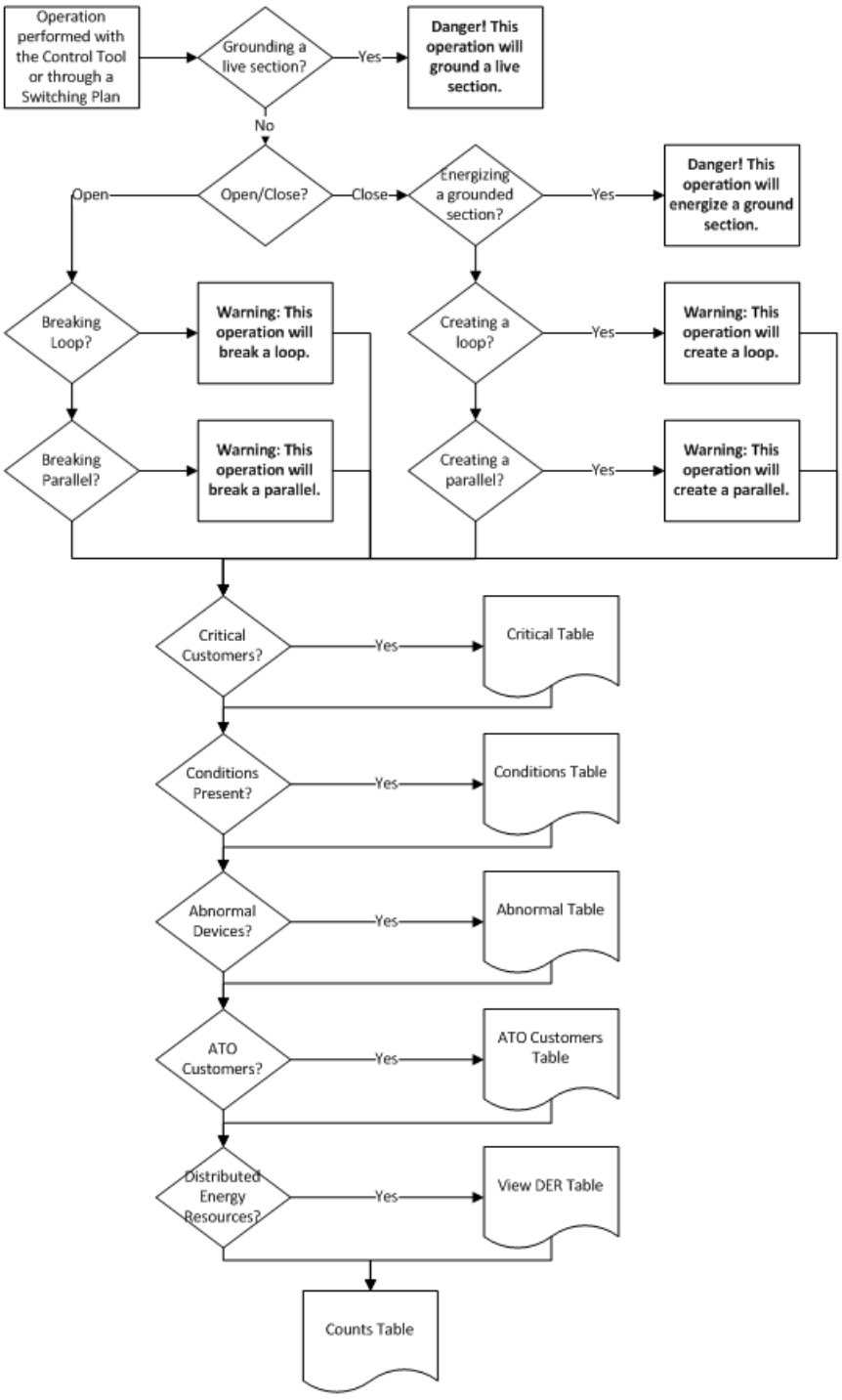
Understanding the Look Ahead Process

The Look Ahead dialog box displays whenever a switching operation is initiated from the Control Tool in energized or de-energized portions of the distribution system. The Look Ahead dialog box displays a warning if an operation will create or break loops or parallels. Counts, conditions, and abnormal device information are not available when dealing with loops and parallels.

If the operation will outage or restore the system, additional data is gathered and displayed in the Look Ahead dialog box. The information displayed depends on the results of performing the operation. A tab is enabled only if table information is available. You cannot open or close a device until you view any abnormal devices or conditions (see **View Abnormal Tab** on page 2-126).

> **Note**: If you attempt to open a switch in an outage area, the system displays the Create Nested Outage dialog box before displaying the Look Ahead dialog box. The dialog box provides the following options:
>
> - Click **Yes** to create a nested outage.
> - Click **No** to open the switch without creating a nested outage.
> - Click **Cancel** to cancel the operation.

The following flow diagram below shows the basic logic of the Look Ahead dialog box.


Operation performed with the Control Tool or through a Switching Plan
Grounding a live section?
Yes
Danger! This operation will ground a live section.
No
Open/Close?
Open
Close
Energizing a grounded section?
Yes
Danger! This operation will energize a ground section.
Breaking Loop?
Warning: This operation will break a loop.
Creating a loop?
Yes
Warning: This operation will create a loop.
Breaking Parallel?
Warning: This operation will break a parallel.
Creating a parallel?
Yes
Warning: This operation will create a parallel.
Critical Customers?
Yes
Critical Table
Conditions Present?
Yes
Conditions Table
Abnormal Devices?
Yes
Abnormal Table
ATO Customers?
Yes
ATO Customers Table
Distributed Energy Resources?
Yes
View DER Table
Counts Table

Understanding the Look Ahead Dialog Box

The Look Ahead dialog box contains tabs and tables that display event and device-related information. The information provided on the Look Ahead dialog box are described below:

- Header and Power Flow Results
- Drop Count Tab
- Pickup Count Tab
- ATO Customers Tab
- View Conditions Tab
- View Abnormal Tab.
- View Critical Tab
- View Cap. and Reg. Tab
- Violations Tab
- View DER Tab
- DMS Setting Tab

Header and Power Flow Results

When operating in Real Time with Web Switching enabled, the step recording tool will also be displayed at the top of the Look Ahead Dialog. Step recording tools include Switching Sheets, Standalone Safety Documents, Event Details Steps tab, and the Miscellaneous Log. This label will be hidden in Study mode if no tool is actively recording Study actions.

- The **Device : Device Type** field displays the name of the device being operated followed by the device type.
- The **Phases to operate** field displays the phases of the device being operated.

Buttons

- **Run Power Flow:** allows you to generate a Power Flow solution for the device. If the device's island is configured to solve using kVA mode, the Power Flow Results tab will display **(kVA)**; if it is configured to solve in Power Flow mode, it will display **(Power Flow)**. The Power Flow Results are displayed at the top of the Look Ahead dialog box. If any violations occurred during the run, the **Violations Tab** tab is enabled and the violations are listed.
- For example, if you open a tie switch and then click the **Run Power Flow** button, the Power Flow Results pane displays the Breaking Current amps, the voltage difference, and the number of violations.
- See Chapter 12, Power Flow for more information about Power Flow. The button is only available if Power Flow is licensed for your system.
- **Preview:** allows you to generate a trace in Viewer that highlights the area affected by the device operation. For example, if you open a device and click the **Preview** button, the Viewer displays the network area that will be de-energized.

  Note: The Preview button is only enabled when the network is going to be de-energized. When the Look Ahead is closed (by confirming the operation or clicking **Cancel**), the trace highlighting will be removed.

Drop Count Tab

The Drop Count tab displays the number of customers affected by the device operation. This tab provides information for Total Customers and total Critical Customers, with sub counts for four groups of critical customers.

- The **Drop** columns display the drop information for the device. Information is displayed as counts dropped downstream of the device.
- The **Feeder** column display the total counts for the feeder on which the device to operate is located.
- The first set of Drop and Feed columns shows data for the total counts.
- The following three sets (A, B, and C) show data for each individual phase.
- The next set shows counts for multi-phase customers. The counts for the individual phases (A, B, C) and multi-phase add up to the counts in the first or total columns (that is, A+B+C+Multi-Phase = Total).
- The last row shows the total distributed generation kVA for each phase. This is only available when **Power Flow** is licensed.

Pickup Count Tab

The Pickup Count tab displays the number of customers affected by the device operation. This tab provides information for Total Customers and total Critical Customers, with sub counts for four groups of critical customers.

- The first set of two columns shows data for the total counts. The following three sets of two columns show data for each individual phase (A, B, and C), with the last set showing counts for multi-phase customers. The counts for the individual phases (A, B, C) and multi-phase will add up to the counts in the "total" columns (that is, A+B+C+Multi-Phase = Total).
- The **Pickup** columns display the pickup information for the device. Information is displayed as counts picked up downstream of the device.
- The **Feeder** columns display the total counts for the feeder on which the device to operate is located.

ATO Customers Tab

The ATO Customers tab displays the number of customers affected by automatic ATO operations as a result of the device operation. These customers are not listed in the Counts table.

On loss of the primary feed:

- The ATO Customers page lists customers downstream from a pair of enabled ATO switches with a live secondary feed, because they will experience a momentary outage.
- The ATO Customers page does not list customers downstream from a pair of ATOs if either the primary or secondary switch is disabled. These customers appear on the Counts table, because they will experience a sustained outage.
- The ATO Customers page does not list customers downstream from a pair of ATOs if the secondary feed is already lost. These customers appear on the Counts table, because they will experience a sustained outage.

On restoration of the primary feed:

- The ATO Customers page lists de-energized customers who will be auto-returned if the secondary feed is already lost.
- The ATO Customers page lists currently energized customers who will be auto-returned if the ATO is configured as a "break before make" on auto-return.
- The ATO Customers page does not list currently energized customers who will be auto-returned if the ATO is configured as a "make before break" on auto-return.

Similarly to the Counts table, the ATO Customers table provides information for total Critical Customers with sub counts for three types of critical customers, Interrupting Current (phase), and Total Customers.

The first column shows data for the total counts. The following three columns show data for each individual phase (A, B, and C), with the last set showing counts for multi-phase customers. The counts for the individual phases (A, B, C) and multi-phase will add up to the counts in the "total" columns (that is, A+B+C+Multi-Phase=Total).

The rows displayed in the counts table include Crit Customers, EMR Customers, MED Customers, KEY Customers, Interrupting Current and total customers. Click on the View ATO Custs button to access ATO Customer information from any of the other views.

View Conditions Tab

The View Conditions tab shows any special conditions currently active on the circuit, including crew locations, tags, notes, and so on. If conditions are present, you must view the conditions table to complete the operation. Click on the View Conditions tab to access condition information.

The Conditions table displays the following columns:

- The **Condition** column displays the type of condition that is present on the feeder such as a truck_location (crew), tag, note, and so on.
- The **Device** column displays the name of the device on which the condition is located.
- The **Location** column indicates whether the condition is upstream or downstream of the current device.
- The **User Name** column displays the user name of the user that created the condition.
- The **Date/Time** column displays the date and time that the condition was created.
- The **Description** column displays information about the condition. For example, if the operation affects a device with an associated document, the file name would be listed.

View Abnormal Tab

The **View Abnormal** tab displays data about abnormal devices on the same feeder as the device to operate. An “abnormal device” is any device that is not in its nominal state (for example, an open device that is normally closed).

The Abnormal table displays the following columns:

- The **Device** column displays the name of the device that is in an abnormal state.

- The **Nominal Status** column displays the normal status of the device.
- The **Current Status** column displays the current status of the device.

View Critical Tab

The **View Critical** tab shows customers classified as critical (for example, emergency, medical, key) that would be impacted by the proposed device operation.

The Critical Customers table displays the following columns:

- The **Name** column displays the critical customer's name.
- The **Critical Type** column displays the critical classifications for the customer.
- The **Address** column displays the critical customer's address.
- The **Phone** column displays the critical customer's telephone number.

View Cap. and Reg. Tab

The View Cap. and Reg. tab displays capacitors and regulators on the same feeder as the device to operate. The View Cap. and Reg. table displays the following columns:

- The **Device** column displays the name of the capacitor or regulator.
- The **Location** column indicates whether the device is upstream or downstream of the current device.
- The **Phase** column displays the phases of the capacitor or regulator.

Violations Tab

The **Violations** tab displays a list of all violations reported by Power Flow the last time Power Flow was run on this device. If Power Flow has not been run or no violations were encountered, this tab is grayed out.

Click the **Run Power Flow** button on the Look Ahead dialog box to run Power Flow. The Power Flow results are displayed at the top of the dialog box. If violations are encountered during the run, the **Violations Changes** tab is enabled and the violations are listed in the violations table.

Actions

- The **Violations** tab provides a **Viewer Target** button ( ) to focus the **Viewer** on the device in a selected row.
- The **Violations** table may be printed by clicking the **Print** button ( ).

The Violations table displays the following columns:

- The **Substation** column displays the substation name.
- The **Feeder** column displays the feeder name.
- The **Nominal kV** column displays the normal operating voltage of the device.
- The **Device** column displays the device name.
- The **Violation** column displays the violation or warning name. See **Data Source and Data Quality** on page 17-36 for range of values and colors for this column.
- The **Phase** column displays the phase that the violation is on.
- The **Value Before** column displays the value before the action.

- The **% Before** column displays the ratio of the value before to the limit.
- The **Value After** column displays the value after the action.
- The **% After** column displays the ratio of the value after the action to the limit.
- The **Limit** column displays the violation/warning limit**.**
- The **Status** column displays the result of the action on the violation.
  - **Removed:** the violation has been removed by the action.
  - **Added:** a new violation will be added due to the action.
  - **Better:** changed from violation to warning after the action or the percent decreased (increased for under voltage violations/warnings) more than the threshold.
  - **Worse:** changed from warning to violation after the action or which percent increased (decreased for under voltage violations/warnings) more than the threshold.
  - **Same:** violations that exist in both lists and have values that did not change or the change was less than the threshold.

Three context menus enable filtering of the table data:

- **Violations Only**, **Warnings Only**, or **Violations and Warnings**
- **Changes**, **After**, or **Before**:
  - **Changes:** only shows changed violations resulting from the action.
  - **Before:** shows the violations before the action.
  - **After:** shows the violations after the action.

  Note: The **Violations** tab label changes based on the **Changes**|**Before**|**After** choice. Also the violation counts displayed will change based on the combination of the drop-down list options selected (for example, Warnings Only / Before or Violations Only / After, and so on).
- **Violation Types:** Protection, Conductor, Distributed Generation, Power Transformer, Distribution Transformer, Switch, Voltage, Backfeed, and Feeder Capacity. Each violation type displays the violation and warning count in parenthesis when you click the context menu.

Each violation change has a specific background and font color-code:

- **Added:** red background, white foreground
- **Worse:** orange background, black foreground
- **Better:** yellow background, black foreground
- **Removed:** green background, black foreground

See Chapter 12, Power Flow for more information.

View DER Tab

The View DER tab displays data about distributed energy resources (DER) on the same feeder as the device to operate.

The DER table displays the following columns:

- The **Device** column displays the name of the DER device.
- The **Rated Size (kVA)** column displays the rating of the device.
- The **Unit Count** column displays the number of units the device represents.
- The **Phase** column displays the phases of the DER device.
- The **Location** column indicates whether the DER device is upstream or downstream of the current device.

Buttons

- The **Open** button opens the device. If an "open" operation is being performed on a closed device, the **Open** button is enabled. If special conditions exist, then you must view the **View Conditions** tab before the **Open** button becomes enabled. Likewise, if abnormal device statuses exist, then you must view the **View Abnormal** tab before the **Open** button becomes enabled.
- The **Close** button closes the device. If a "close" operation is being performed on an open device, the **Close** button is enabled. If special conditions exist, then you must view the **View Conditions** tab before the **Close** button becomes enabled. Likewise, if abnormal device statuses exist, then you must view the **View Abnormal** tab before the **Close** button becomes enabled.
- The **Help...** button opens the online help content for Look Ahead.
- The **Cancel** button cancels the device operation and closes the Look Ahead dialog box.

DMS Setting Tab

DMS Settings tab displays the list of feeders involved in the operation with their DMS settings, such as FLISR Mode Disabled (see **DMS Settings** on page 2-7 for details). The settings are configured using the Configuration Assistant Feeder Management tab; see **Using the Feeder Management Tab** on page 24-32 for details. The tab includes the following information:

- Substation
- Feeder
- PF Mode (hidden by default)
- FLISR
- FLM (hidden by default)
- Optimization
- FLA
- Optimization Objective
- Feeder Type (hidden by default)
- PF History (hidden by default)

Note: See **Understanding Column Display Options** on page 1-7 for information on hiding and unhiding table columns.

The tab is enabled for real time mode and allows user to change the settings for Optimization and FLISR for any or all of the involved feeders from this tab. The changes to DMS settings can be saved by clicking the **Save** button ( ). This will also send a message to the Power Flow service, which is called **PFService**, to reload the feeder

settings for processing on its applications. The settings can be refreshed or reloaded by clicking the **Refresh** button ( ).

Selecting Columns to Display in the Table

You can choose which columns to display in the table. To select columns to display, follow these steps:

1. Right-click the table header row and select **Select Columns…** from the context menu. A list of the columns is displayed.
    - Selected columns are displayed in the table.
    - Deselected columns are hidden.
2. Select or deselect columns to show or hide them, respectively.
3. Click **OK**.

Associating Documents with Devices

The Manage Documents window allows **Administrative** users to create and remove associations between modeled device and documents that are stored in the Oracle Utilities Network Management System.

Using the Manage Documents Window

To open this window, select **Manage Documents...** from the Web Workspace **Tools** menu.

The Manage Documents window displays the following fields and buttons:

- The **Selected Device** field lists the device selected in the Viewer.
- The **Manage Documents** field lists any documents associated to the device.
  - The **Unassociate** button allows you to remove the association between the selected device and a document selected in the Manage Documents field.
  - The **View Document** button allows you to view the selected document.
- The **Available Documents** field lists the contents of the `documents` directory (that is, `$NMS_HOME/data/drawings`). Use the blank text field to filter the Available Documents list. Enter all or part of the document you are looking for; the list is dynamically updated to display document names that include the text you enter.

  Note: Documents must be saved directly to the `documents` directory as any files saved to sub-directories will not be visible to the tool.
- The **Associated Devices** field lists which devices have an association with the currently selected item in the Available Documents list.
- The **Associate** button allows you to associate the currently selected item in the **Available Documents** list with the **Selected Device**.
- The **View Document** button allows you to view the currently selected item in the Available Documents list.
- The **Exit** button closes the Manage Documents window.

Associating a Document with a Device

To associate a document with a device, complete these steps:

1. Login to Web Workspace as an Administration user.
2. Select **Manage Documents...** from the Web Workspace **Tools** menu. The Manage Documents window opens. (See the previous section for field descriptions.)
3. Open a Viewer. Locate and select the device to associate to a document. The Manage Document window's **Selected Device** field populates with the name of the selected device.
4. Select the item from the Available Documents list that you wish to associate with the selected device. The **Associate** and **View Document** buttons are activated.
5. [Optional] Click **View Document** to display the document in an external viewer. For example, viewing a JPEG file might open the file in Windows Photo Viewer.

6. Click **Associate** to create the association between the selected document and selected device. The following occurs:
    - The Manage Documents list populates with the document's filename and the Associated Devices field populates with the name of the selected device.
    - In the Viewer, a document condition now appears on the selected device.
7. Click **Exit** to close the Manage Documents window.

Removing a Document Association

To remove an association between a document and a device, complete these steps:

1. Login to Web Workspace as an Administration user.
2. Select **Manage Documents...** from the Web Workspace **Tools** menu. The Manage Documents window opens.
3. Open a Viewer. Locate and select the device that you wish to disassociate from a document. The Manage Document window's Selected Device field populates with the name of the device and the Manage Documents pane lists all associated documents.
4. In the Manage Documents list, select the document you wish to disassociate from the device. The **Unassociate** and **View Document** buttons are activated.
5. [Optional] Click **View Document** to display the document in an external viewer. For example, viewing a JPEG file might open the file in Windows Photo Viewer.
6. Click the **Unassociate** button to remove the association between the selected document and selected device. The following occurs:
    - The selected document is removed from the Manage Documents list.
    - In the Viewer, a document condition is removed from the selected device.
7. Click **Exit** to close the Manage Documents window.

Associating Damage Assessments to a Device

You can enter damage assessment for a device. Damage assessment incidents are not included in counts for the event. The damage assessment trouble code has an associated clue symbol Damage Assessment clue symbol (letters 'DA' in a red circle), which will be displayed in Viewer at the damage location.

When you enter damage assessment information, you can select one or more crew types needed to repair the reported damage.

If multiple damage assessments exist for an event, the system will calculate the estimated repair time by adding together estimated repair times from each active damage assessment.

To enter damage assessment information for a device, complete the following steps:

1. Open the Viewer.
2. Select a device and open its Control Tool.
3. Click the Control Tool's **Damage Assessment...** button. The Event Details Damage Assessments tab opens for the selected device. Any existing damage assessment records for the device will be displayed in the list.

4. Click the **New Damage Assessment** ( ) toolbar button. The Damage Assessment window opens. The **Damaged Assets** table contains a single row for the selected device.
5. Complete additional fields on this screen as needed. See **Understanding the Damage Assessment Window** on page 3-50 for field descriptions.
6. Click the **Save** button on the toolbar.
7. New damage assessment is created. In the Viewer, a damage assessment symbol appears on the device. The damage assessment would either create new event or group into an existing event.
8. Once the damage has been assessed, populate the Damage Specifics, Damaged Assets, and Attachments sections and click the **damage has been assessed** ( ) toolbar button to indicate that the damage assessment has been performed. The status of the damage assessment changes to Assessed. Estimated Time to Repair for the event may get updated based on entered damage details.

Completing and Instructing Actions

When you perform actions in the Control Tool while you are recording in Web Switching Management, the system automatically populates fields in the associated switching sheet as follows:

- The date field on the Control Tool, which defaults to the current date and time, is used to populate the Completed Date field in the associated switching sheet when an operation is completed in the Control Tool.
- If steps are instructed to a crew, this date is used to populate the Instructed Date field in the switching sheet.

The **Instructed Actions** area below the date field displays a list of actions that have been instructed on the selected device. The drop-down list allows you to select an instructed action to complete.

The **Show Sheet...** button displays the sheet that contains the selected instructed action so you can execute the actions from Web Switching Management.

> **Note:** This option is available only when Web Switching Management is licensed. This allows you to navigate to the switching sheet so you can perform the step from there. If you are not using Web Switching Management, you can **Complete**, **Abort**, or **Fail** the selected instructed action from the Control Tool.

Condition Summaries

The Condition Summaries window lists all conditions, including notes, tags, pending decommissions or constructions, and FLISR actions.

This section includes the following topics:

- Using the Condition Summaries Window
- Toolbar and Menu Options
- Using Condition Summaries Balloon Details
- Editing Conditions

Using the Condition Summaries Window

To view the Condition Summaries window, select **Condition Summaries...** from the Web Workspace **Actions** menu in.

The Condition Summaries includes the following fields and buttons:

- The **Type** column contains the type of condition, such as Note, Tag, Pending Construction, Pending Decommission, FLISR Action, and Associated Document.
- The **Status** contains the status of the condition. Usually blank, but will list "Issued" for conditions that are part of an issued safety document. Other values may be configured.
- **Condition #** is the system-assigned identifier of the condition.
- The **Date Created** column contains the date and time the condition was created.
- The **Substation** column contains the name of the substation that serves the device on which the condition is located.
- The **Feeder** column contains the name of the feeder that serves the device on which the condition is located.
- The **User** column contains the user name of the individual who placed the condition.
- The **Device** column contains the name of the device on which the condition is located.
- The **Phase** column contains the name of the phase associated with the condition.
- The **Condition Info** column contains the text of the note or other condition.

Toolbar and Menu Options

File Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshes the Condition Summaries window to display the most recent updates. If you edit a condition using the **Edit** button, you must refresh the summary to see your changes.	
Print Preview...	Displays the Print Preview window, from which you can view and print the summary.	
Delete Row...	Deletes the selected condition from the system. A confirmation dialog box prompts you to confirm before deleting. Once deleted, the condition disappears from both the Summary and the Viewer.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the Condition Summaries window.	--

Sort Menu

Menu Option	Description	Toolbar Icon
Sort Dialog...	Displays the Sort Dialog. The Sort Dialog option on the Sort menu performs the same function. See **Using the Sort Dialog Box** on page 1-9 for common sort functions.	
Condition #	Sorts the Conditions Summaries table by the Condition # column.	--
Device	Sorts the Conditions Summaries table by the Device column.	--
Date Created	Sorts the Conditions Summaries table by the Date Created column.	--

See **Sorting Data Tables** on page 1-9 for additional information on using standard sorting features.

Actions Menu

Menu Option	Description	Toolbar Icon
Edit...	Opens the Edit balloon dialog box. See **Editing Conditions** on page 2-137.	
Enable View Balloon	Enables or disables balloon details. When enabled, a call-out balloon opens that provides information, such as notes or related device documents, if applicable, for a selected row. See **Using Condition Summaries Balloon Details** on page 2-137 for more information.	
View...	Focuses the Viewer on the device associated with the condition.	

Help Menu

Menu Option	Description	Toolbar Icon
Condition Summaries Help	Opens the online help system to the Condition Summaries help content.	--

Using the Conditions Summary Filter Pane

The Conditions Summary has the following Global filters:

Filter Name	Description
All Conditions	Displays all conditions.
FLISR Actions	Displays only rows with **Type** equal to **FLISR Action.**
FLISR Disabled	Displays only rows with **Type** equal to **FLISR Disabled**.
Notes	Displays only rows with **Type** equal to **Note**.
Pending Construction	Displays only rows with **Type** equal to **Pending Construction**.
Pending Decommission	Displays only rows with **Type** equal to **Pending Decommission**.
Quarantine	Displays on rows for the **Quarantine (QUAR)** work queue.
Tags	Displays only rows with **Type** equal to **Tag**.

See **Filtering Data Tables** on page 1-11 for information on using Filter panes.

Using Condition Summaries Balloon Details

The Condition Summaries Balloon Details displays device information (for example, note text and associated documents) for applicable rows selected in the Condition Summaries list.

To enable Balloon Details, click the **Balloon Details** button ( ) on the Condition Summaries toolbar.

To view condition details (when Balloon Details is enabled):

1. Select a row in the Condition Summaries table. Balloon Details displays information about the selected condition, if available or applicable.
2. To close the balloon, click the close button in the balloon's top right corner.

Editing Conditions

To edit a selected condition, click the **Edit** button. The Edit balloon opens.

From this dialog box, you can perform the following tasks:

- Edit the condition information as desired, then click the **Save** button.
- Click the **View** button to focus the Viewer on the device.
- Click the **Print** button to print the condition text.
- Click the **Revert** button to revert to the last saved version of the condition text.
- Click the **Help** button to launch online help for the dialog box.

  Notes:

  - The Edit dialog box also appears if you double-click a condition row when Balloon Details are turned off.
  - Depending on the condition, you may be able to delete a condition by selecting the condition row and clicking the **Delete** button ( ) from the Condition Summaries toolbar.

Using the Alarm Displays

The Web Workspace **Tools** menu's **Alarm Displays** sub-menu provides options to view current alarms (**Alarms...** option), devices in abnormal states (**Abnormal Devices...** option), and alarm history (**Alarm History...** option).

Understanding the Alarms List

To display active alarms, select **Alarms...** from the Web Workspace **Tools** menu. The Alarms tool lists active alarms in your system. The types of alarms will depend on what Oracle Utilities Network Management System applications and integrations implemented. The Alarms tool has three main components:

- Alarm Priority Pane
- Alarms Table
- Alarms Filters Applied

Alarms Tool Menus and Toolbar

File Menu

Menu Option	Description	Toolbar Icon
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	--
Exit	Closes the window.	--

Sort Menu

The table below describes the options available on the **Sort** menu.

Menu Option	Description	Toolbar Icon
Sort Dialog...	Opens the Sort Dialog, allowing you to create, modify, apply, and save user-defined sorts. See **Using the Sort Dialog Box** on page 1-9.	--
Default	Applies the default sort.	--
Priority	Sort by alarm priority.	--

Actions Menu

Menu Option	Description	Toolbar Icon
View...	Focuses the Viewer on the device associated with the alarm.	
Acknowledge	Acknowledges the selected alarms.	
Silence	Silences the selected alarms.	
Clear	Clears the selected alarms.	
Silence all alarms...	Silences all alarms.	

Options Menu

Menu Option	Description	Toolbar Icon
Show all zones	Display alarms for all zones.	--
Show milliseconds	Toggles the display of time down to milliseconds.	--

Help Menu

Menu Option	Description	Toolbar Icon
Help	Opens the online help content.	--

Alarm Priority Pane

The **Alarms** priority pane shows the count of alarms by priority and allows you to filter the **Alarms** table by selecting or deselecting priorities.

Alarms Table

The **Alarms** table displays alarm data in rows.

> **Note:** Like other data tables, the **Alarms** table shows certain columns by default, but you may select the columns to view using standard table functions. See **Working with Tables** on page 1-6 for more information.

- The **Child Count** (**+**) column contains the count of the number of child alarms associated with the alarm, if applicable. Click the **Child Count** cell to view the child alarms associated with the parent alarm. The child alarms are displayed
- The **Unacknowledged** column contains a bell icon ( ) if the alarm is unacknowledged.
- The **Priority** column contains the priority associated with the alarm. The priority field's background is filled with the priority's associated color while the alarm is not acknowledged.
- The **Alarm Time** column contains the time the alarm was generated in the field. For a SCADA alarm, this is the timestamp supplied by the RTU.
- The **Class** column contains the alarm class associated with the alarm. The alarm classes group alarm types. For example, in the NMS product configuration, alarms generated by an NMS Advanced Distribution Management System application would be in the `DMS` class.
- The **Category** column contains the alarm category associated with the alarm. Categories are child groupings of Class. For example, an alarm generated by Fault Location Analysis, would be in the category `FLA`.
- The **Attribute** column contains the type of SCADA measurement or System alarm. An ellipsis in the **Attribute** cell indicates that there is more information available; if you hover over the cell, a tooltip will display all of the unique attributes.
- The **Alarm Message** column contains the alarm text, which are preconfigured for the alarm class/category. An ellipsis at the beginning of the alarm message indicates that there is more information available; if you hover over the cell, a tooltip will display all of the unique messages. The lines in the tooltip are the unique messages from the alarm and its child alarms. For example, if there are three child alarms and each have unique messages, the tooltip will contain four lines.
- The **Phases** column contains the phases applicable to the alarm.
- The **Phases Present** column contains the device's phases whether involved in the alarm condition or not.

> **Note:** Other columns are available. See **Understanding Column Display Options** on page 1-7 for information on showing and hiding columns.

Alarms Filters Applied

The **Filters Applied** pane provides a tree view of the alarm classes and categories. You can deselect nodes in the tree to hide those types of alarms. If you deselect a class, all alarms associated with the class (and its child categories) will be filtered from the table.

Working with Alarms

Acknowledging Alarms

To acknowledge an alarm, complete these steps:

1. Select the row of the alarm you want to acknowledge.
2. Click the **Acknowledge** button ( ).

Silencing Alarms

To silence an alarm, complete these steps:

1. Select the row of the alarm you want to silence.
2. Click the **Silence** button ( ).
   - The audio notification for the alarm becomes silent.
   - The alarm is still not acknowledged.

   Note: To turn audio notifications on or off, select or deselect **Audio Enabled**, respectively, from the **User** menu's **User Interface Settings** submenu. The audio for the entire system (all alarms) will toggle on or off. See **Understanding the Web Workspace User Menu** on page 2-8 for more information.

Clearing Alarms from the List

To remove an alarm, complete these steps:

1. Select the row of the alarm you want to clear.
2. Click the **Clear** button ( ). The alarm disappears from the list.

   Note: You can remove multiple alarms by selecting multiple rows before you click the **Clear** button ( ).

Understanding the Abnormal Devices List

Abnormal Devices displays all devices that are not in their nominal state. For example, if a switch that is nominally closed is currently open, it will display in the Abnormal Device Summary. If a SCADA system is integrated with Oracle Utilities Network Management System, any devices that are reported by a SCADA point as being in an off-nominal state will also display. This will also display any wire downs or jumpers, or emergency cables in either an open or closed state.

To access the Abnormal Device Summary, select **Alarms and Devices Lists** and then **Abnormal Device Summary…** from the Web Workspace **Tools** menu.

The Abnormal Devices List displays the following fields:

- The **Alarm Time** column contains the date and time when the abnormal condition occurred.
- The **Substation** column contains the name of the substation that serves the abnormal device.
- The **Feeder** column contains the name of the feeder that serves the abnormal device.
- The **Device** column contains the name of the abnormal device.
- The **Attribute** column contains information about the abnormal condition. For example,
- The **Alarm Message** column contains a description of the operation that caused the abnormal state.
- The **Phases** column contains the phases in an abnormal state.
- The **Phases Present** column contains the device's phases whether involved in the abnormal condition or not.

Understanding the Alarm History List

The Alarm History list shows all alarms that have been generated over a selected period of time. The Alarm History list does not condense related alarms so every alarm will be displayed as a row in the table. In addition, operator initiated actions in response to an alarm will be displayed in the Alarm History, but will not be displayed in the Alarms list since an operator does not need to be notified of their own actions.

- The **Unacknowledged** column contains a bell icon (🔔) if the alarm is unacknowledged.
- The **Priority** column contains the priority associated with the alarm. The priority field's background is filled with the priority's associated color while the alarm is not acknowledged.
- The **Alarm Time** column contains the time the alarm was generated in the field.
- The **Class** column contains the alarm class associated with the alarm.
- The **Category** column contains the alarm category associated with the alarm.
- The **Attribute** column contains the type of SCADA measurement or System alarm.
- The **Alarm Message** column contains the alarm text, which are preconfigured for the alarm class/category.
- The **Phases** column contains the phases applicable to the alarm.
- The **Phases Present** column contains the device's phases whether involved in the alarm condition or not.

  Note: Other columns are available. See **Understanding Column Display Options** on page 1-7 for information on showing and hiding columns.

Using the User Log

The User Log displays a log of actions taken by a user.

To open the User Log, select User Log... from the Web Workspace **Tools** menu.

The User Log window displays the following fields:

- The **User ID** field opens with the current user's identification, but the field may be edited to load log entries for a different user; for a different user log, enter their user ID and click **Load User Log** button ( ).
- The **Begin Time** and **End Time** fields allow you to filter the User Log by time. To load log entries for a specific time period:
  - Enter a starting date in the Begin Time field.
  - Enter an ending date in the End Time field.

  Note: You can enter a beginning date, an ending date, or both.

  - Click the **Load User Log** button ( ). The list is refreshed to display only entries with a date and time greater than or equal to the Begin Time and less than or equal to the End Time.
- The **User Comment** field allows you to enter a user comment log entry.
- The **User Log Table** has the following fields:
  - The **Date/Time** field displays the date/time at which the log entry occurred.
  - The **Event** field displays the Event # associated with the log entry.
  - The **Text** field displays a description of the log entry.
  - The **Sheet/Doc #** field displays the switching sheet or safety document number associated with the log entry.

Menus and Toolbar

File Menu

Menu Option	Description	Toolbar Icon
Export Table...	Opens a dialog box to allow you to save the table data to a comma separated value (csv) file.	
Print...	Opens the print dialog box to allow you to print the current list.	
Exit	Closes the window.	

Actions Menu

Menu Option	Description	Toolbar Icon
Load User Log	Loads the User Log for the for the current filter parameters (User ID, Begin Time, and End Time).	
Clear	Clears the user log.	
View...	Displays the device associated with the log entry in the Viewer.	
Event Log...	Displays the Event Log for a selected user log entry associated with an event.	
Event Details...	Displays the Event Details window for the event associated with the selected log entry. This option is also available from the context menu.	
Switching...	Displays the switching sheet or safety document associated with the selected log entry. Enabled only when the log entry is associated with a switching sheet or safety document. This option is also available from the context menu.	

Help Menu

Menu Option	Description	Toolbar Icon
User Log Help	Opens the online help system to the User Log help content.	

Adding Entries to the User Log

Comments may be entered for the current time or for the time associated with a selected log entry. When you begin to add text to the **User Comment** field, the button to add the entry will be sensitized; there are two types of buttons based on whether a row is selected in the User Log table ( ) or not ( ).

Adding New User Log Entries

To enter a new note to the User Log:

1. Enter the note text in the field and click the **Add** button ( ) to submit the entry.

   Note: The User Log does not automatically refresh on other user environments, so the new comment will not appear in the table for other users until the user log is reloaded by clicking the **Load User Log** button ( ).

Adding an Associated User Log Entry

To enter a note associated to an existing User Log entry:

1. Select a User Log entry row to associate to a new note.

2. Enter the note text in the field and click the add to selected entry button ( ) to submit the entry.

   Note: The User Log does not automatically refresh on other user environments, so the new comment will not appear in the table for other users until the user log is reloaded by clicking the **Load User Log** button ( ).

Changing Entry Type Before Submitting User Log Entry

When you begin to add text to the User Comment field and the add button becomes sensitized, you may select or deselect a row to change the entry type.

For example, you want to enter a new note, but realize that the add associated comment button ( ) is sensitized, press Control and click the selected row to deselect it; the button will change to the add new entry button ( ).

Chapter 3

Managing Events with Web Trouble Management

This chapter describes the Oracle Utilities Network Management System Web Trouble application's event management functions including tools that build upon the Web Workspace to help you manage trouble events. It includes the following topics:

- Understanding Event Details
- Confirm and Restore Outages
- Setting Work Queues
- Understanding Event Grouping
- Associating and Unassociating Calls with Devices or Control Zones
- Working with Stable Predictions
- Working with Damage Assessments
- Working with AMI Requests
- Updating the ERT for Selected Events
- Working with the System-Wide Estimated Restoration Time
- Using the Trouble Summary

Understanding Event Details

Event Details is used is used to enter and track information about events. It displays different types of event information in tabs. Multiple events may be displayed with their own tab.

To open Event Details, double-click the desired event's row in the Work Agenda. You can also select an event and click the **Event Details** toolbar button or select **Event Details...** from the Work Agenda **Actions** or the row's context menu.

The Event Details window is comprised of:

- Menus and Toolbar
- Understanding the Event Information Pane
- Understanding Event Details Tabs

Menus and Toolbar

This section describes the menu and toolbar options. In the tables below, each menu item is listed along with sub-menu options, if available, and the default toolbar icon, if applicable; menu items without a default toolbar icon are indicated with a double dash (--) in the toolbar icon cell.

File Menu

Menu Option	Description	Toolbar Icon
Save	Saves the current event. If the event has already been completed, you are prompted to provide a reason for the update.	
Print Tab...	Opens the Print Preview dialog box and allows you to print the current contents of the Job Actions tab.	
Print All...	Opens the Print Preview dialog box and allows you to print the contents of all three Event Details tabs.	
Exit	Exits Event Details. You must press the **Save** button before pressing the **Exit** button if you wish to save any revisions you may have made.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Complete Event	Sets the status of the current event to Complete. If the required fields (**Remedy** and **Failure**) have not been entered, this option will not be available. This option is not available for switching or planned outage events.	
Maintenance	Sets the status of the current event to Maintenance Pending. If the required fields (**Remedy** and **Case Note**) have not been entered prior to selecting, an error will be displayed that will list the missing information.	
Copy	Copies the case notes and details for the currently loaded event to all other events related to it based on its partial restoration.	
Switching...	Opens the **Open or Create New Switching Sheet** dialog box, which allows you to create a new switching sheet or open a switching sheet associated with the selected event. See **Open or Create New Switching Sheet** on page 11-90 for more information.	
View...	Show device associated with the event in the Viewer.	
Refresh	Refreshes the information in the window.	

Understanding the Event Information Pane

The top section of the Event Details window contains event attributes:

- The **Event #** is the number the system has assigned to the event.
- The **Phases Out** is the event phases.
- The **# Calls** is the number of calls for the event.
- **Customers Out** contains the estimated number of customers experiencing an outage for this event.
- The **# Emer.**, **# Med.**, **# Key**, and **# Sens.** list the critical customers affected by the event.
- **Start Date** contains the date and time when the event began. This field is editable except for switching events. For switching events, you must edit the **Completed Date** in the switching step itself. See **Steps Tab** on page 11-28 for more information.
- **Est Restore Date** contains the estimated restore date for the event. You may edit or clear the estimated restore date using standard Date/Time controls (see **Using Date/Time Pickers** on page 1-5 for details).
- **Restore Date** contains the date and time of event restoration (that is, when the outage area was restored). This field is editable except for switching events. For switching events, you must edit the Completed Date in the switching step itself. See **Steps Tab** on page 11-28 for more information.
- **Est Time to Repair** contains the estimated time to repair the event.
- The **Device** is the name and type of device associated with the event
- The **Sheet #** is the switching sheet number associated with the event, if any. The switching sheet number is prefixed by the switching sheet type.
- **Clues** contains any clues contained in the customer calls.
- **Zone** displays the control zone where the associated device is located.

Updating the Estimated Restoration Time

Once a crew has arrived onsite and reported their assessment of when the event will be restored, you can update the estimated restoration time using Event Details. To update the estimated restoration time, complete these steps:

1. Select the event in the Work Agenda window.
2. Click the **Event Details** toolbar button or select **Event Detail...** from the **Actions** menu. The Event Details window opens.
3. On the **Event Details** pane, enter the amount of time (in hours and minutes) that the crew will take to restore the outage in the **Est Time to Repair** field.
4. Click the **Save** button. The updated time displays in the Est Restore Date fields, and other windows that display the Est Restore Date will be updated.

Understanding Event Details Tabs

The Event Details windows provides a tabbed user interface to provide the tools to work an event in discrete views. The tabs are described in the following sections:

- Using the Job Actions Tab
- Using the Completion Actions Tab
- Using the Equipment Failure Tab
- Using the Trouble Info Tab
- Using the Damage Assessments Tab
- Using the Event Log Tab
- Using the Steps Tab
- Using the Fault Location Analysis Tab
- Using the FLISR Report Tab
- Using the Optimization Report Tab
- Using the Attachments Tab

Using the Job Actions Tab

The **Job Actions** tab lets you view detailed information about the event.

- The **Restoration Log** pane contains a table that displays device operation information related to the restoration. The table is not populated when there are no device operations affecting the event (for example, with a PDO). The table is not displayed when the event is a non-outage. The Restoration Log table contains the following columns:
  - **Stage:** contains the restoration stage number
  - **# Out Before:** Contains the number of customers out before this operation
  - **Start Date:** Contains the time the customers were originally outaged.
  - **Operation Date:** Contains the date and time of the operation.
  - **Duration:** Contains the outage duration for this set of customers
  - **CMI:** Contains the CMI for this set of customers (the **Duration** times the **# Restored**).
  - **Device:** Displays the device operated at each stage.
  - **Phases:** Contains the phases operated for this stage
  - **# Restored:** Contains the total number of customers that were restored at each stage.
  - **# Added:** Contains the total number of customers that were added at each stage.
  - **# Out After:** Contains total number of customers still without power after each stage.
  - **Remarks:** Contains any comments or remarks entered by the user or external system.

    - The **Event #:** column contains the event number associated with each partial restoration step.
- The **Operations Event Note** pane contains a text field that allows you to enter notes about the event and a table listing existing notes. The table contains the following columns:
    - **Event #:** The event for which the note was submitted.
    - **Date/Time:** The date and time when the note was submitted.
    - **User:** The user who added the note.
    - **Note:** The note text.
    - **Versions:** Whether older versions of the note exists or not (Yes/No).

See **Using the Operations Event Note Pane** on page 3-6 for details on available actions.

- **Call Comments:** The Call Comments table displays any comments contained in customer calls for the event.
- **The En Route/Onsite Crews Pane**
    - The **Next Crew Contact Required at** table displays when the operator next anticipates receiving contact from associated crews. Use the **Reset Selected Crew Contact Time** button to reset the crew contact time to the date and time you enter in the **Date** field.
    - The **En Route/Onsite Crews** table contains the following columns:
        - **Event #:** Contains the event where the crew is working.
        - **Crew ID:** Contains the crew name.
        - **Contact:** Displays the contact name for the assignment.
        - **Mobile #:** The crew's mobile phone number.
        - **Assign Date:** Contains the time at which the crew was first assigned to the event. This date can be edited.
        - **Dispatch Date:** Contains the time at which the event assignment was actually communicated to the crew. This column is empty if the crew has not been dispatched yet. This date can be edited.
        - **En Route Date:** Contains the time at which the crew was placed en route to the event. This column is empty if the crew has not started en-route yet. This date can be edited.
        - **On Site Date:** Contains the time at which the crew arrived on site. This date can be edited.
        - **Contact Required By:** Contains the date and time at which the next contact is expected.

Using the Operations Event Note Pane

The Operations Event Note pane allows you to create, edit, delete, and view previous versions of the note.

- To create a note, enter text in the text field and click the add note button ( ). The note will be added to the Operations Event Note table.
- To edit a note, select the note row, right-click, and select **Edit...** from the context menu. The current note will populate the note text field. Edit the text and click the check mark button ( ) to save a new version. To exit edit mode without saving changes, click the X button ( ).
- To view previous note versions, right-click the note row, and select **Show Versions...** to open the Operations Event Note History dialog box, which lists the date and time when the previous versions were created, the user who created it, and the note text. Click **OK** to close the dialog box.
- To delete a note, select the note row, right-click, and select **Delete** from the context menu.

Notes:

- Deleting a note removes the note and all versions from the Operations Event Note pane.
- A configuration SRS rule (`maintainJobCommentHistory`) determines whether previous note values are stored when a note is modified or deleted. If the rule is disabled, the note history will not be saved.

Using the Completion Actions Tab

The **Completion Actions** tab lets you view detailed information about the event, as well as enter information about the actions taken to complete the event. The first section displays summary information about the event, including the duration and scope of the event. The second section lets you enter information about the cause of the outage, the affected system and subsystem, environmental factors, and the actions that were taken to restore the outage. The third section allows you to exclude the event from the interruption indices calculations. The fourth section displays a log of changes made to the event details after the event was completed. The fifth section contains buttons that let you perform various actions associated with the event (for example, complete the event).

For instructions on completing an event, see **Completing an Event** on page 3-36.

The **Completion Actions** tab displays the following fields and buttons:

- **Event Began** contains the date and time at which the event began. This field is editable except for switching events.
- **Est # of Cust Out** contains the estimated number of customers experiencing an outage for this event.
- **Event Restored** contains the date and time of event restoration (that is, when the outage area was restored). This field is editable except for switching events.
- The **Details** section displays the following drop-down lists.
    - The **System** drop-down list lets you specify what type of system the failure is on (for example, overhead transmission, underground distribution, supply, and so on).
    - The **Sub-System** indicates the type of sub-system (for example, primary or secondary, radial or mesh, service drop, and so on.
    - The **Type** drop-down list lets you specify the type of device that is experiencing the problem.
    - The **Failure** drop-down list lets you specify the type of failure that is occurring.
    - The **Interrupting Device** drop-down list lets you specify the type of interrupting device involved with the event.
    - The **Primary Cause** drop-down list lets you specify the type of primary cause issues involved with the event, such as weather, environment, and so on.
    - The **Weather** drop-down list lets you specify weather conditions at the time of the event.
    - The **Environment** drop-down list lets you specify any environmental factors that may have been involved with the event.
    - The **Vegetation** drop-down list lets you specify the type of vegetation issues involved with the event, such as tree or vine, location (on or off ROW), and severity (contact or uprooted).
    - The **Foreign Interference** drop-down list lets you specify animals, vehicles, or any other type of foreign body that has contributed to the event.
    - The **Defective Equipment** drop-down list lets you specify the type of equipment defect involved with the event (for example, age deterioration, customer equipment, and so on)

- The **Scheduled** drop-down list lets you specify whether or not the event was planned and if it was planned for safety purposes.
- The **Utility Error** drop-down list lets you specify the reason for the event if it was caused by the utility company.
- The **Other** drop-down list lets you specify if the cause is something other than that listed in the drop-down lists or if the cause is unknown.
- The **Remedy** drop-down list lets you specify the task performed to resolve the event.

- The **Interruption Indices** section displays the following fields:
  - The **Exclude This Event** check box allows you to designate if you want to exclude this event from the interruption indices calculations done by the Oracle Utilities Network Management System – Trouble Reporting application. The Exclude from Interruption Indices check box is not displayed for switching or planned outage events.
  - The **Reason for Exclusion** field provides free-form text entry of the reason for the exclusion of this event from the interruption indices. The Reason for Exclusion field is not displayed for switching or planned outage events.
- The **Edit Log** table displays information related to event details being edited after the event is completed. This table contains the following columns:
  - The **Who** column contains the user ID of who performed the edit.
  - The **Date** column contains the date and time of the edit.
  - The **Reason** column contains a description of why the edit was made.
  - The **Field** column contains the name of an **Event Details** field that changed after the event was completed.
  - The **Previous Value** column contains the value of the field prior to the change.

  Note: If multiple fields are edited post-completion, each change will be listed in a separate row.

Using the Equipment Failure Tab

The **Equipment Failure** tab lets you record detailed information about any failed equipment related to an event. You can record and track the type of equipment that failed, the manufacturer, serial number, and voltage details.

The Equipment Failure tab displays the following fields and buttons:

- **Failure Item** is automatically populated with the Failure option selected in the Event Details tab.
- The **Manufacturer** drop-down menu provides a list of manufacturers to select from.
- **Serial #** is an editable (alphanumeric) field for you to enter the serial number for the equipment.
- **Date of Manufacture** is an editable (date/time) field for you to enter the date of manufacture of the equipment.
- **Date of Installation** is an editable (date/time) field for you to enter the date of installation of the equipment.
- **Primary Voltage** is an editable (alphanumeric) field for you to enter the primary voltage of the equipment.
- **Secondary Voltage** is an editable (alphanumeric) field for you to enter the secondary voltage of the equipment.
- **Rating** is an editable (alphanumeric) field for you to enter the rating of the equipment. The drop-down list beside the Rating field allows you to select the rating units.
- **Phase** allows you to designate whether the equipment is single-phase or three-phase.
- **Type** is an editable (alphanumeric) field for you to enter the type of equipment.
- **Size** is an editable (alphanumeric) field for you to enter the size of the equipment.

Recording Failed Equipment Information

To record information about a failed device, complete these steps:

1. From the Event Details window, click on the Equipment Failure tab.
2. Select the manufacturer from the **Manufacturer** drop-down menu.
3. Enter the serial number, dates of manufacture and installation, primary and secondary voltage, rating, type, and size of the equipment, as applicable.
4. Select the rating unit (Amps, kV, kVA, kVAr) from the drop-down menu next to the Rating field.
5. Select the **Phase**.
6. Click the **Save** button.

Using the Trouble Info Tab

The **Trouble Info** tab has four views; the view that is displayed when you open the **Trouble Info** tab depends on where you launched it from.

View	Description	Toolbar Icon
Using the Trouble Info Callers View	Lists all calls associated with an event.	
Using the Trouble Info Customers View	Lists all the customers: • Located on or downstream from a given device, when accessed via the Control Tool. • Outaged by a given event, when accessed via the Work Agenda Trouble Event lists. Non-outage events will not list any outaged customers.	
Using the Trouble Info Supply Points View	Lists all the supply points associated with the event or selected in the Viewer	
Using the Trouble Info AMI Customers View	Depending on where it's accessed from, the AMI Customers view lists all the AMI-enabled meters located on or downstream from a given device or affected by a given event.	

Trouble Info Tab Menus and Toolbar Icons

The **Trouble Info** tab changes dynamically based on the view. The following tables describe the menus and toolbar actions available in the Trouble Info views.

File Menu

Menu Option	Description	View	Toolbar Icon
Callers	Changes the Trouble Info tab to the Using the Trouble Info Callers View.	All	
Customers	Changes the Trouble Info tab to the Using the Trouble Info Customers View.	All	
Supply Points	Changes the Trouble Info tab to the Using the Trouble Info Supply Points View.	All	
AMI Customers	Changes the Trouble Info tab to the Using the Trouble Info AMI Customers View.	All	
Export Table...	Opens a dialog box to allow you to save the current table view data to a comma separated value (csv) file.	All	
Print	Opens the Print Preview dialog box, allowing you to print the current contents of the current view.	All	

Sort Menu

Menu Option	Description	View
Sort Dialog...	Opens the Sort Dialog, which allows you to choose the sort columns and type (that is, ascending or descending).	All
Default	Sorts the table according to the default settings for the view.	All

Actions Menu

Menu Option	Description	Views	Icon
Refresh	Refreshes the data in the current view.	All, except AMI Customers	
Call Info...	Opens the Call Info window for the selected call. See **Viewing Call Info** on page 3-15.	Callers	
Ungroup	Opens the Ungroup dialog box, allowing you to ungroup the selected calls from the event.	Callers	
Unassociate	Opens the Unassociate dialog box, allowing you to unassociate the selected calls from this device and (optionally) associate them with a new device. See Unassociating a Call from a Device for more information.	Callers	
Transfer Call	Opens the Transfer Call dialog box, allowing you to transfer the selected call(s) to a different event. See **Transferring a Call to a Different Event** on page 3-17 for more information.	Callers	
Move Customers...	Opens the Move Customers dialog box, allowing you to move selected customers to a new device. See **Moving Customers to a Different Device** on page 3-22 for more information.	Callers, Customers	
Show DER Units...	Opens the Customer DER Units dialog box, allowing the user to view relevant information for each customer DER unit. **Note:** This option will only be enabled if the DER count column is equal or greater than one.	Customers	--
Edit Clues...	Opens the Edit Clues dialog box for the selected call. See Editing Call Clues for details.	Callers	
View	Targets the Viewer on the Supply Point for the selected call.	Supply Points	
Remove	Removes the selected device from the event.	Supply Points	
Update Event	Updates the event by saving changes, such as removing a device from an event.	Supply Points	

Menu Option	Description	Views	Icon
AMI Confirm	Requests meter pings from AMI system for the selected customers, if applicable. See **Creating AMI Requests** on page 3-58 for details.	AMI Customers	
AMI Load Side	Requests load side connection information from the AMI system for the selected customer.	AMI Customers	--
AMI Voltage	Requests a voltage reading from the AMI system for the selected customers.	AMI Customers	--
AMI Power History...	Opens the AMI Power History dialog box for the selected customer. **Note:** If no AMI Power History data exists, a 'No AMI Meter Power History' dialog box will be displayed.	AMI Customers	
AMI Load Side History...	Opens the AMI Load Side History dialog box for the selected customer. The table displays the following: • The date the load side connection information was received. • The meter load side connection status. **Note:** If no AMI Load Side History data exists, a 'No AMI Meter Load Side History' dialog box will be displayed.	AMI Customers	--
AMI Voltage History...	Opens the AMI Voltage History dialog box for the selected customer. The table displays the following: • The date the voltage data was received. • The voltage value. For multiphase meters, this column may contain multiple voltage values. **Note:** If no AMI Voltage History data exists, a 'No AMI Meter Voltage History' dialog box will be displayed.	AMI Customers	
Disable AMI	Disables AMI functionality for the selected meters. This option is only available when Oracle Utilities Network Management System is integrated with Oracle Utilities Smart Grid Gateway.	AMI Customers	

Menu Option	Description	Views	Icon
Enable AMI	Enables AMI functionality for the selected meters. This option is only available when Oracle Utilities Network Management System is integrated with Oracle Utilities Smart Grid Gateway.	AMI Customers	

Trouble Info Filter Pane

The **Trouble Info** table has the following Global filters:

Menu Option	Description
All	The **All** filter (default) displays all of the rows in the table.
All Critical	The **All Critical** filter displays all rows where the Critical column is populated.
EMR	The **EMR** filter displays all rows where the Critical column contains Emergency, Fire, Police, or 911.
KEY	The **KEY** filter displays all rows where the Critical column contains Entertainment, Government, Key, Manufacturing, or Transportation.
MED	The **MED** filter displays all rows where the Critical column contains Medical, Hospital, Nursing Home, or Life Support.
SENS	The **SENS** filter displays all rows where the **Critical** column is set to Sensitive.

Using the Trouble Info Callers View

The **Trouble Info** tab's **Callers** view lists all calls associated with an event.

Understanding the Calls Table

The Calls Table lists all calls associated with an event. The table provides the following information:

- The **Event #** column displays the event number for the call.
- The **Clues** column displays the trouble code clues received for the call.
- The **Device** column displays the name of the customer's service device.
- The **Name** column displays the customer's name.
- The **Telephone** column displays the customer's telephone number.
- The **Date/Time** column displays the date and time of the customer's call.
- The **Critical** column displays the customer type value of the customer.
- The **Cmt** column displays a Y/N code depending on whether the call contains customer comments or not, respectively.

- The **Address** column displays the customer's address.
- The **Account #** field displays the customer's account number.

Understanding the Comments Table

The Comments table displays all customer comments associated with the event. If there is a comment associated with a call, selecting the call in the Calls Table will highlight the comment in the Comments table. The Comments table contains the following information:

- The **Name** column displays the customer's name.
- The **Comment** column displays the customer's comment.

Understanding Callers View Actions

The following actions are available using the Callers View:

- Viewing Call Info
- Ungrouping Calls
- Unassociating a Call from a Device
- Moving Customers to a Different Device
- Editing Call Clues

Viewing Call Info

Detailed information about a logged call is displayed in the Call Info window. An event (represented by a single row in the Work Agenda) can have multiple calls if the calls have been grouped to one event. The Call Info window may be accessed from the Event Details Trouble Info tab. You cannot edit the fields in the Call Info window; they are read only.

To open the Call Info window from the Trouble Info Callers view, select the row of the call you want to display and either click the **Call Info...** button or select **Call Info...** from the **Actions** menu.

Call Info Window

The Call Info window displays the following fields and buttons:

- **Account #** displays the customer's account number.
- **Event Status** displays the current status of the event that this call is a part of.
- **Telephone** displays the customer's phone number.
- **Event #** displays the number assigned to the event by the system.
- **Name** displays the customer's name.
- **Clues** displays the short description representation of the Request drop-down list selections that were entered when the call was logged.
- **Address** displays the customer's address.
- **Reported Start Date** displays the date and time the problem began for the customer.
- **City** displays the customer's city, state and zip code.
- **Call Taker ID** displays the user name of the person who entered the call.

- **Customer Type** displays the customer type value for the customer.
- **Crew ID** displays the name of the crew that has been placed en route to/is onsite at the event, if any.
- **Customer Device** displays the name of the customer's service device.
- **Callback Date** displays the date and time of the last callback attempt.
- **Callback Result** displays the callback result, when applicable
- **Zones** displays the control zones the customer is located in.
- **Customer Comment** displays any customer comments that were entered at the time the call was logged.

Buttons

- The **Print** button opens the Print Preview dialog box, which allows you to print the currently displayed customer call information.

Menus

The Call Info window provides the following menu options.

File Menu

- **Print** – Opens up the Print Preview dialog box, which allows you to print out the contents of the currently displayed customer call information
- **Exit** – Closes the Call Info window

Help Menu

The **Help** menu displays the standard **Help** and **About** options.

Ungrouping Calls

You can ungroup calls that were automatically grouped by the system as a result of trouble analysis rules. For example, you would ungroup a call from an event when it is not actually related to the event, but rather should be its own non-groupable event. To ungroup calls, complete these steps:

1. Select the event row in the Work Agenda you want to ungroup and click the **Trouble Info...** button ( ). The Event Details **Trouble Info** tab opens to the **Callers** view.
2. Select the row in the Calls Table for the call you want to ungroup.
3. Select **Ungroup** from the **Actions** menu. The Ungroup dialog box opens with the device related to the event populated in the **Device** field.
4. Click **OK**.
    - In the Work Agenda, the call is ungrouped and a new event row appears in the Trouble Events list with the appropriate device association.
    - In the Work Agenda, the ungrouped call is removed from the # Calls column for the event it was ungrouped from.

    Note: Events that are manually ungrouped will not be automatically grouped again by the system. However, you can manually group them again.

Editing Call Clues

You can edit the clues associated with one or more calls, which will cause the event's clues to be changed. You can also enter comments that will be appended to the existing call comments.

To edit clues for a call, complete these steps:

1. Select an event in the Work Agenda with at least one call.
2. Select the **Trouble Info** button ( ) to open Event Details. Trouble Info tab opens to the Callers view.
3. Select one or more rows in the Calls Table.
4. Click the **Edit Clues** toolbar button ( ) or select **Edit Clues...** from the **Action** menu. The Edit Clues dialog box opens.
5. Use the drop-down lists to select different clues.
6. Enter remarks in the Comments box, if desired.

   Note: The Customer Remarks section is view-only.
7. Click **OK**. The system performs a reprediction to see if the event can now be grouped to other events or be grouped to by other events, based on the updated clues. The system also recalculates the dispatch priority and target response time for any event associated with the modified calls.

Unassociating a Call from a Device

You can move a customer to a different device if you discover the customer is associated with an incorrect device. To move a customer to a different device, complete these steps:

1. Select an event in the Trouble Events list (in the Work Agenda window) with at least one call.
2. Select the **Trouble Info** button ( ). The Event Details Trouble Info tab opens to the Callers view.
3. Select a row in the Calls table and select **Unassociate** from the **Actions** menu.

Transferring a Call to a Different Event

If you discover that a call relates to an event that is not at the caller's location (for example, if a customer calls to report a problem with a service line going to their neighbor's house), you can move the call.

To move calls to a different event from **Event Details**, complete these steps:

1. Select an event in the Work Agenda that has calls that need to be moved.
2. Select the **Trouble Info** button ( ). The **Event Details Trouble Info** tab opens to the **Callers** view.
3. Select one or more rows in the Calls Table that you wish to transfer to another event. You have two options:
   a. Select **Transfer Call** from the **Trouble Info** tab **Actions** menu (or the right-click option menu). The Transfer Call dialog box will open. Select the target event's row in the Work Agenda to fill the **Event** field in the dialog box. Click **OK** to confirm the transfer or click **Cancel** to leave the call unchanged.
   b. You may drag the selected call row(s) to the event row in the Work Agenda.

To move one or more calls to a different event using the **Viewer**, complete these steps:

1. Display call symbols by selecting **Toggle Call Display** on the outage device or selecting the **Show All Calls** option in the Viewer's **Hide / Display** dialog box.
2. Drag the call symbol to the desired event location on the Viewer or the event's Work Agenda row.
3. If there are multiple calls associated with a call symbol in the Viewer, you will be asked to confirm the calls you want to move.
4. You will then be asked to confirm the event to move the call(s) to.
5. When dragging to an event symbol on the Viewer, if there is more than one event at the selected target location, all events for the device will be listed and one must be selected.

Using the Trouble Info Customers View

The data shown in the **Trouble Info Customers** view depends on how it is launched.

- If launched from the Control Tool, it displays all customers located on or downstream from a given device (see **Device Options** on page 2-56 and **Control Tool Actions** on page 2-101 for information).
- When Trouble Info is launched from the Work Agenda, the Customers view displays all customers affected by a given event.

Understanding the Customer Table

The Customer Table lists all customers associated with an event or device. The table provides the following information:

- The **Device** column displays the name of the customer's service device.
- The **Phases** column displays the phases of the customer's service device.
- The **Name** column displays the customer's name.
- The **Telephone** column displays the customer's telephone number.
- The **Critical** column displays the customer type value.
- The **Priority** column displays the customer's weighted priority. See **Using the Customer Administration Weighted Priority Editor** on page 24-68 for more information on weighted priority.
- The **Address** column displays the customer's address.
- The **Account #** column displays the customer's account number.
- The **DER Count** column displays the number of DER units associated with the customer.
- The **Event ID** column displays any customer associated events.
- The **Clues** column displays the clues for the outage or event. Only the clues associated with the first customer call will be listed.
- The **Call Date** column displays the date and time when a customer reported the event. If there are multiple calls from a customer, the first (non-AMI) call will be displayed.
- The **Restore Date** column displays the most recent time an outage affecting the customer was restored. When Trouble Info is opened for an event, only the restoration times for that event are displayed; if the **Restore Date** column is empty, then the customer is currently affected by the selected outage event. When Trouble Info is opened for a device, this will also occur if the customer never experienced an outage.
- The **Total Calls** column display the number of times the customer called.

Customers View Actions

You can perform the following task from the Customers View:

- Moving Customers to a Different Device
- Viewing a Customers DER Units

Using the Trouble Info Supply Points View

Depending on where it's accessed from, the Trouble Info Supply Points view lists all of the supply Points located downstream from a given device, or all of the supply points associated with a given event. Open this view by clicking on the **Supply Points** toolbar button or selecting **Supply Points** from the File Menu in the Trouble Info Callers or Customers view.

The Supply Points View displays the following fields:

- **Event Information**
  - The **Event #** field displays the number assigned to the event by the system.
  - The **Feeder** field displays the feeder on which the affected device resides.
  - The **Event Device** field displays the name of the device associated with the event.
  - The **Device Type** field displays the type of device associated with the event.
- **Supply Point Summary** displays totals for all supply points. (See below for descriptions of the columns in this section.)
- The table below the Supply Point Summary lists the following information for each supply point.
  - The **Device** column displays the name of the customer's service device.
  - The **# Customers** column displays the sum of all customers attached to the supply point.
  - The # **Emer.** column displays the sum of all Emergency, Fire, Police, and 911 customers attached to the supply point.
  - The # **Med.** column displays the sum of all Medical, Hospital, Nursing Home, and Life Support customers attached to the supply point.
  - The # **Key** column displays the sum of all Entertainment, Government, Key, Manufacturing, and Transportation customers attached to the supply point.
  - The # **Sens.** column displays the sum of all the Sensitive customers attached to the supply point.
  - The **# Critical Total** column displays the sum of all critical customers attached to the supply point.
  - The **Control Zone** column displays the supply point's control zone name.
  - The **Event #** column displays the event number for the supply point.
  - The **Start Date** column displays the time the supply point was outaged.
  - The **Restore Date** column displays the time the supply point was restored.
  - The **Group** column displays the pending action for the row:
    - TBG – To Be Grouped
    - TBU – To Be Ungrouped
    - FAIL – Action failed

Use the **View** button to view a selected device in the Viewer.

Click the **Remove** button to remove a device from the event.

Click the **Update** button to save changes.

For information about the **Update Event** button, see **Graphical Grouping (Supply Points Mode)** on page 3-45 for more information.

Using the Trouble Info AMI Customers View

Depending upon where it's accessed from, the Trouble Info AMI Customers view lists all the AMI-enabled meters located on/downstream from a given device or affected by a given event. The **AMI Customers** view is updated automatically; consequently, the **Refresh** action is not available when this view is selected.

Open this view by clicking on the **AMI Customers** toolbar button or selecting **AMI Customers** from the **File** menu in the Trouble Info Callers or Customers view.

Event Information

Event Information populates the top portion of the AMI Customer View.

- The **Event Information** field displays the number assigned to the event by the system.
- The list title displays how many AMI Customers are located on/downstream from a given device, affected by a given event, or affected on a given device.
- The **Feeder** field displays the feeder on which the associated device resides.
- The **Event Device** field displays the name of the associated device.
- The **Device Type** field displays the type of the associated device.

Customer Table

The Customer table portion of the AMI Customers View displays information for the individual customers.

- The **Device** column displays the name of the customer's service device.
- The **Phases** column displays the phases of the customer's service device.
- The **Name** column displays the customer's name.
- The **Telephone** column displays the customer's telephone number.
- The **Critical** column displays the customer type value of the customer.
- The **Address** column displays the customer's address.
- The **Account #** column displays the customer's account number.
- The **Meter #** column displays the customer's meter number.
- The **Enabled** column displays the status of AMI functionality. A value of "Y" means that AMI functionality is enabled while a value of "N" means that AMI functionality is disabled. An asterisk next to the value (for example, Y*) means that a request to enable or disable AMI functionality is currently in progress for the meter.
- The **Status** column displays the latest unsolicited meter status received from AMI.
- The **Status Date** column displays the date of the latest unsolicited meter status.
- The **Ping Result** column displays the result of the most recent meter ping.
- The **Result Date** column displays the date of the most recent meter ping result.

- The **Load Side** column displays the latest load side connection status for the meter (Connected/Disconnected).
- The **Voltage** column displays the latest voltage reading for the meter. For multiphase meters, this column may contain multiple voltage values.
- The **Nominal** column displays the meter's nominal voltage value.
- The **Request #** column displays the index of the last AMI ping request.
- The **Request Date** column displays the date of the last AMI ping request.
- The **Request Type** column displays the type of the last AMI ping request (Power, Voltage or Load Side status).
- The **Requested By** column displays the login name of the user who made the last AMI ping request.
- The **Completed By** column displays the login name of the user who completed the last AMI ping request.

Related Information
See **Working with AMI Requests** on page 3-57 for more information.

Viewing AMI Customers for a Device
To view AMI customers for a particular device:

1. Select a device in Viewer and open the device in the Control Tool.
2. Click the **AMI Customers…** button in the Control Tool. The Event Details Trouble Info tab opens, and the AMI Customers table is populated with the customer information for AMI-enabled customers on the selected device.

Moving Customers to a Different Device
Trouble Info allows you to move customers to a different device if you discover they are associated with an incorrect device. The Move Customers tool is available from both the Callers and Customers views.

To move customers to a different device, complete these steps:

1. Select one or more customers to move from the Customers view

   Notes:

   - You can use the Callers view if the customers that you want to move are all also callers.
   - To select multiple adjacent customers, click the first customer row and then press the Shift key and click the last customer row.
   - To select multiple non-adjacent customers, press the Control key and click each customer row individually.
2. Select **Move Customers…** from the **Actions** menu. The Move Customers dialog box appears.
3. Select a device in the Viewer to move the customers to. The **New Device** field is populated with the device identifier.
4. Click **OK**. The Move Customers dialog box closes.

Note: If the selected customers were previously moved to a new device, a confirmation dialog box (that is, Overwrite Moved Customers) is displayed. Do one of the following:

- Click **Yes** to continue and overwrite the existing customer move record.
- Click **Cancel** to cancel your selection and return to the Move Customers dialog box to select a different device.
- Click **No** to abort the move completely.

5. The event is then re-analyzed using the new device information. If it does not repredict into the same event, the # Calls and # Customers for the original event are adjusted. Calls may be grouped into another existing event or a new event will be created.

   Note: Trouble Info will be updated with the Move Customer information.

Viewing a Customers DER Units

Trouble Info allows a user to view information related to DER units associated to an individual customer. This dialog will show the following information related to DER units, the technology type, phasing, rated size, and voltage. This dialog is only available from the Customers view.

To view DER units for a customer, complete the following steps:

1. Select a single customer in the **Customers** view that has a DER Count greater than or equal to one.
2. Select **Show DER Units...** from the **Actions** menu. The Customer DER Units dialog box appears.

   Note: The **Show DER Units...** option will only be available if the DER Count is greater than or equal to one.
3. The dialog will open showing relevant information for each DER associated to the customer.
4. Click **Close**. The Customer DER Units dialog box closes.

Using the Damage Assessments Tab

The **Damage Assessments** tab displays summary information for damage assessment records associated with an event. See **Working with Damage Assessments** on page 3-50 for information about creating and working with damage assessments.

Menus and Toolbar Icons

File Menu

Menu Option	Description	Toolbar Icon
New...	Create a damage assessment in the Damage Assessment tool.	
Open...	Open the currently selected record in the Damage Assessment window.	
Reload	Reload the table data.	
Print...	Print the content of the Damage Assessments table.	

Actions Menu

Menu Option	Description	Toolbar Icon
View...	Focuses the Viewer on the device associated with the selected damage assessment.	
Event...	Opens the Event Details for the event associated with the selected damage assessment.	
Patrol Event...	Opens the Event Details for the patrol event associated with the selected damage assessment. Only enabled when the column Patrol Event # is populated for the selected damage assessment.	
Assessing	Marks the selected damage assessments as Assessing.	
Assessed	Marks the selected damage assessments as Assessed.	
Standing By	Marks the selected damage assessments as Standing By.	
Fixed	Marks the selected damage assessments as Fixed.	
Obsolete	Marks the selected damage assessments as Obsolete.	

Filter Menu

Menu Option	Description	Toolbar Icon
Auto Filter Off	Clears any auto-filter values that were set by right-clicking a Damage Assessment record in the table and selecting **Auto Filter**.	

Understanding the Damage Summary Pane

The Damage Summary pane displays a summary of data for the damage assessments associated with the selected event or device. The pane lists the crew types required to repair, a list of damaged devices, and a list of other details.

- **Required Crews:** Displays a list of the crew types and the number needed.
- **Damaged Assets:** Displays a list of damaged assets and displays the number of those devices that are accessible or inaccessible.
- **Summary Data:** Displays a list of additional information.
  - **Total Repair Time (HH:MM):** Displays the estimated total time to repair.
  - **# Load Affected:** Displays the number of loads affected by the damage, if any.
  - **# Street Lights Damaged:** Displays the number of street lights that are damaged, if any.
  - **# Roads Blocked:** Displays the number of roads that are blocked.
  - **# Hazardous:** Displays the number of hazardous conditions related to the damage.

Understanding the Damage Assessments Table

Damage Assessments Table Filter Pane

The Damage Assessments table has the following Global filters:

Menu Option	Description
Active Damage Assessments	Show all active Damage Assessments.
All	Show all damage assessments.
Complete	Show all complete Damage Assessments.

Damage Assessments Table Columns

- **Status:** The status of the listed damage assessment.
  - **New:** The initial state of a damage assessment.
  - **Assessed:** The assessment is done. Damage Assessments in the Assessed state are included in estimated repair time calculations.
  - **Complete:** The event has been restored.
  - **Obsolete:** The damage assessment no longer applies to the event.
- **Event #**: The event number associated with the damage assessment.

- **Patrol Event #:** The patrol event number associated with the damage assessment, if applicable.
- **Report Date:** The date and time when damage assessment was performed.
- **Reported By:** The crew that reported the damage.
- **Crew:** The crew that performed the damage assessment.
- **Mobile #:** The crew's mobile number.
- **Assigned Crew:** The crew assigned to the assessment.
- **Hazard?:** Whether the damage is hazardous.
- **Device:** The device alias.
- **Address:** The damage location address.
- **Feeder:** The name of the feeder.
- **Region:** The region-level control zone name.
- **Branch:** The branch-level control zone name
- **Substation:** The substation-level control zone name.

To view, edit, or create damage assessment information for an event:

1. Select an event from the Event List in the Work Agenda.
2. Select **Damage Assessment...** from the **Actions** menu. Event Details will open with the **Damage Assessments** tab in focus. Any existing damage assessments will be displayed in the table.

Using the Event Log Tab

The Event Log tab displays a table with all actions taken for the event. To display the Event Log for a particular event, select a row in the Work Agenda list and select **Event Log...** from the **Actions** menu.

The table displays the following information:

- The **Date/Time** field displays the date/time of the log entry.
- The **User** field displays the user that initiated the action.
- The **Event** field displays the identifier of the original event for which the log entry was generated. Note that, due to grouping activities, the original event may no longer exist.
- The **Text** field displays a description of the log entry.

The Event Log may be exported using the Event Details **File** menu's **Export Table...** option, which is visible on the Event Log and certain other tabs having table data that can be exported.

Using the Steps Tab

The **Steps** tab displays the switching steps that have been recorded and linked to the event. These steps will continue to be displayed in the event's **Steps** tab up until you create an Emergency switching sheet for the event. When an Emergency switching sheet is created, the steps will be moved to that sheet.

When this **Steps** tab is first selected for an event, any steps linked to that event will be pulled from the Miscellaneous Log to this Steps list.

If any crews are listed in the **Steps** tab's Crews List, then those crews will be automatically filled into those steps' **Instructed To** field. You can update these assignments later if that is desirable.

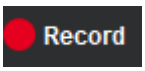
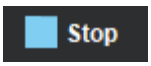
Steps can be cut/copied from other sheets and pasted into this Steps list; steps can be cut/copied form this Steps list and pasted into other sheets as well. Steps cannot be cut/copied from one event's Steps list and pasted into another event's Steps list. For pasting of steps to work, the source tool or sheet has to be loaded. To work around this limitation, the steps can be sent to the Miscellaneous Log and then later cut and pasted into a different event's Steps list.

Steps Tab Toolbar and Context Menus

The Steps tab toolbar displays buttons for actions that you can perform. If a button is grayed, then that action is not currently permitted. Some toolbar buttons, such as the Cut and Paste options, are also available through a context menu that is displayed when you right-click a step row. The context menu contains some options that do not appear on the toolbar.

The table in the next section describes all actions that can be performed on the Steps tab with toolbar buttons, keyboard shortcuts, and/or context menu items

Understanding Steps Tab Actions

To perform this action	Do this	Comments
Turn record mode on	Click 	Record mode must be on in order to record operations using the Viewer and Control tool. The status bar displays the recording mode status.
Turn record mode off	Click 	The status bar displays the recording mode status.
Mark the selected step as crew ready for instruct.	Click	This button is enabled only when the step state is New or Uninstructed and none of the selected steps have already been marked as Crew Ready. The selected steps also have to be linked to a device. When you click this button, the Crew Ready and Ready Date columns will be populated.
Instruct the selected steps	Click	When you select this button, the Instructed By and Instructed Date columns are populated.
Complete the selected steps	Click	Once the action is complete, the status of the step changes to Completed (**Switching Sheet Step States** on page 11-41). The Completed Date column is also updated with the current date.
Abort the selected steps	Click	Use this action if a step was never attempted. When you click this button, the status of the step changes to Aborted (**Switching Sheet Step States** on page 11-41). The Completed Date column is updated with the current date. However, the switching action is not actually performed.
Mark the selected steps as failed	Click	Use this if a step was attempted but failed. When you click this button, the status of the step changes to Action Failed (**Switching Sheet Step States** on page 11-41) and the Completed Date column is updated with the current date. However, the action is not actually performed against the real-time data model.

To perform this action	Do this	Comments
Clear the **Crew Ready** status	Click	Use this action to clear the Crew Ready and Ready Date columns. This button is enabled only when the step state is in New or Uninstructed state.
Uninstruct an instructed step	Click	Use this action to change the state of an instructed step to Uninstructed (see **Switching Sheet Step States** on page 11-41). If the step has a device and an instruct condition on the device, then the condition will be removed prior to the step transitioning to the Uninstructed state. Steps that are in the Uninstructed state can be instructed again or aborted, failed or completed. **Notes:** • The uninstruct action is not available for SCADA instructed actions. This option is not available for steps in the SCADA Pending state. • Uninstructed steps may be deleted.
Focus the Viewer on the objects referenced in the currently selected list of steps	Click	The toolbar button, when used with single step selections, will focus on a single device and set the environment's selected device to the step's associated device.
Cut steps to the clipboard	Click	Select one or more steps. The selected steps are marked as being cut and are placed on the clipboard. The steps will only be moved after they have been pasted to their new location. Use the **Paste** option to paste the steps. Alternatively, right-click and select **Cut** from the context menu or press **Control+X**.

To perform this action	Do this	Comments
Move Steps to the Miscellaneous Log	--	This action moves Real Time Completed, Aborted, Failed or Instructed steps to the Miscellaneous Log. SCADA Pending steps cannot be moved until they have transitioned to one of the states already stated. Any step in a New or Uninstructed state will not be moved as the Miscellaneous Log only displays Real Time steps that are in a terminal or Instructed state. Any attempt to move an immovable step will result in an error dialog box and the steps will not be moved from the switching sheet's steps list. To move steps to the Miscellaneous Log, select one or more steps and select Move Steps to Misc Log from the right-click context menu.
Copy steps to the clipboard	Click	You can select one or more steps. The selected steps are copied to the clipboard. Select the **Paste** option to paste the steps. Alternatively, right-click and choose Copy from the context menu or press **Control+C**.
Copy steps as go-back steps	Click	You can select one or more steps. Reverse steps are created for each selected step and copied to the clipboard. Select the **Paste** option to paste the steps. Alternatively, right-click and choose **Copy as Go-Backs** from the context menu or press **Control+G**.
Paste steps from clipboard	Click	Steps are pasted after the currently selected step. The operation pastes the steps that were placed in the clipboard during the last **Cut**, **Copy**, or **Copy as Go-Backs** operation. Once the steps have been pasted, the **Paste** button is no longer available and the contents of the clipboard are cleared. Alternatively, right-click and select **Paste** from the context menu or press **Control+V**.

To perform this action	Do this	Comments
Delete steps	Click	Deletes the selected steps from the plan. This button is disabled if the step has transitioned beyond its initial state (No State). Alternatively, right-click and select **Delete** from the context menu or press **Control+D**.
Show Manual Step Addition Form	Click	Shows the Manual Step Addition pane, which allows you to add steps without using the Control Tool. See **Adding Steps Manually** on page 11-43.
Clear the step's Condition Class and Index fields for this step.	Right-click and choose **Clear Condition Indexes** from the context menu.	The action will only happen for steps that are not in a terminal state. Click this button to remove the condition class and index associated to the step. An error dialog box will be displayed if any of the selected steps' condition handles could not be cleared.
Insert a blank step	Right-click and choose **Insert Blank Step** from the context menu.	Inserts a new blank step after the currently selected step. This is useful for adding comment steps. See **Adding Comment Steps** on page 11-44 for more information.
Clear Crews	Right-click and choose **Clear Crews** from the context menu.	Clear the Instructed To fields for the selected steps. This will clear the crew assignments from the selected steps.
Update Step Control Zone Data	Right-click and choose **Update Step Control Zone Data** from the context menu.	If a step's device has been altered and placed into a different control zone, then select this option to update the step's associated control zone.

Step Columns

- **Step #:** Displays the number of the step.
- **Operation:** Displays the description of the switching action. This field is editable, but only if the step action is a non-operational action. In other words, if the action for this step does not impact the NMS model in any way and is not tied to another NMS tool or feature, then the text can be edited in this column. Edited text will show up with a yellow background color. To reset the value, see **Resetting Operation Text** on page 11-44.
- **Device:** Displays the device alias referenced in the step.
- **Phases:** Displays the phase that was selected for the step. When obtaining a device through a Viewer device selection, all the phases are selected by default.

- **Details:** Displays information about the outcome of the switching step., such as:
  - Deenergize a section of the network.
  - Energize a section of the network.
  - Make a loop.
  - Break a loop.
  - Make a parallel. (The feeders involved in the parallel will be listed.)
  - Break a parallel. (The feeders involved in the parallel will be listed.)

This information is recorded into the step when the step is initially added to the steps list. You can enter text into this field to replace the text that is automatically inserted.

- **Status:** Displays the state of the switching sheet step. See **Switching Sheet Step States** on page 11-41 for information.
- **Crew Ready:** Displays whether the field crew is ready to be instructed or not.
- **Ready Date:** Displays the date and time when Crew Ready is populated.
- **Executed By:** Displays the user ID of the person who completed the step in real-time mode. This field is automatically populated by the system.
- **Completed Date:** Displays the date the step was completed. If this field is blank when a step is completed, failed, or aborted in real-time mode, then the system populates this field automatically.
- **Instructed By:** Displays the user ID of the person who instructed the step in real-time mode. This field is automatically populated by the system.
- I**nstructed To:** Displays the IDs of the crews to which the step was instructed. This field is automatically populated if crews are selected in the Crew List at the bottom of the Steps tab when you transition a step to a new state. This field cannot be edited manually. If a crews are listed in the Crews list at the bottom of the Steps tab and none are selected, then all of those crews will be automatically populated into this field when the steps is Instructed or recorded through a Control Tool action. Any steps that get initially populated into the Steps tab will also be automatically populated with the crews lists on this tab's Crews list.
- **Instructed Date:** Displays the date and time the step was instructed.
- **Address:** Displays the address of the device referenced in this step. This field is automatically populated if you record the step by initiating an action within the Viewer.
- **Comments:** Displays any additional information associated with this step. You can enter free-form text in this field.

Crews List

The Crews List on the event's **Steps** tab functions exactly the same as the Crews List on a switching sheet's Steps tab. See **Crews List** on page 11-39 for more details.

Using the Fault Location Analysis Tab

See **Using the Fault Location Analysis Tool** on page 19-4 for details.

Using the FLISR Report Tab

See **Using the FLISR Report Tab in Event Details** on page 18-10 for details on the FLISR Report.

Using the Optimization Report Tab

See **Viewing the Optimization Report** on page 14-10 for details on the Optimization Report.

Using the Attachments Tab

The Attachments tab displays a table with all attachments saved for the event.

Understanding the Attachments Tab Actions

- The **Add Attachment** button ( ): opens the Attach Files dialog box that allows you to attach a file to the damage assessment. Maximum size of the attachment is 50M.
- The **Add Link** button () opens the Add Link dialog box that allows you to add a link to an externally stored attachment that is accessible with an URL. To add a link, complete the following fields:
  - **Name:** a name that is unique for the event.
  - **URL:** link to attachment.
  - **Description:** short description of the attachment contents.

  Click **OK** to add the attachment link or click Cancel to abort the action.
- The **Delete** Attachment button ( ) deletes the attachment
- The **Open Attachment** button ( ) opens the selected attachment. Links are opened in a web browser. Files are opened using application associated with the given file type.
- The **Save Attachment** button ( ) saves the selected attachments.

Understanding the Attachments Tab Table Columns

- **Name:** attachment name (unique within a single damage assessment).
- **File Size:** attachment size in bytes (0 for links).
- **Modified Date:** last modification date for file attachments.
- **Link:** URL of the externally stored attachment.
- **Description:** description of the attachment

Using the Update Events Window

You can use the **Update Events** dialog box to update multiple events with the same completion actions. The dialog box will display all events related to a single Work Agenda row, if any exist, or multiple events selected in the Work Agenda. See the Work Agenda **Actions Menu** on page 2-34 for details on the options available for selected rows.

The **Update Events** window includes the following panes and buttons:

- **Panes**
  - **Events to Update:** Provides a table with information about the selected events. The table contains the following information:
    - The **Event #** column displays the system assigned event number.

- The **Status** column displays the event's status. See **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.
- The **Event Type** column contains a description of the type of event. See **Event Type Codes** on page C-5 for a complete list of event type codes and their descriptions.

- **Operations Event Note:** Text field allowing you to add a note that will apply to all of the selected events.
- **Details:** Provides a subset of fields from the Event Details **Completion Actions** tab.

- **Buttons**
  - **Select All:** Selects all of the check boxes in the **Details** pane.
  - **Unselect All:** Causes any selected check boxes in the **Details** pane to become deselected.
  - **Complete:** Completes all of the events.

  Note: You may only complete events when the required details have been added.
  - **Update:** Updates the events with the selected details or a new operations event note.
  - **Help...:** Launches online help for the Update Events dialog box.
  - **Cancel:** Closes the Update Events dialog box without making any changes to the events.

Updating Multiple Events

1. In the Work Agenda, select an event with related events or select multiple event rows.
2. In the Update Events window, select the values in the **Estimated Restore Time** and **Details** pane that you wish to add to all events. All fields are selected by default when you open the Update Events window; if you do not want a value to change for all events, deselect the check box next to the drop-down list.

   Note: If an event already has information in one or more of the fields, you may select the event to populate the value(s) in the drop-down list(s) and, then, you may update the other events with those values.
3. (Optional) Add an **Operations Event Note**.
4. If you click **Update** or **Complete**, you will be prompted for a reason. Enter the reason, and click **OK** to update all events with the selected event data; if you clicked **Complete**, the system will attempt to complete the events.

   If you subsequently open Event Details for an event separately, you will see that the selected fields were updated and the unselected fields were not modified, any operations event notes were also added to the list of notes for each event, and an Edit Log entry was added for each selected field.

Copying Event Details to Related Partial Restoration Events

You can copy the case notes and other event details for the currently loaded event to all other events related to it based on its partial restoration.

Note: Any previously stored Event Details information for the related events will be overwritten (except for system-populated fields such as Event #, Device, Zones, Event Began, Est # of Cust Out, and Event Restored).

1. Select the event in the Work Agenda window.
2. Click the **Event Details** toolbar button or select **Event Detail...** from the **Actions** menu. The Event Details window opens.
3. Make any desired changes to the event details. Any comments you enter in the Operations Event Note will be applied to all related partial restoration events.
4. Click the **Copy** toolbar button or select **Copy** from the **Actions** menu. The corresponding event details are copied to all related partial restoration events of the currently displayed event. Note that ERT information is only copied to active related events.

Completing an Event

After a crew has reported that an event is complete, you can update the event information in the Event Details window and complete the event. To complete an event, follow these steps:

1. Select the event in the Work Agenda window.
2. Click the **Event Details** toolbar button or select **Event Detail...** from the **Actions** menu. The Event Details window opens.
3. Click the **Completion Actions** tab.
4. Select the appropriate options from the drop-down lists. You must select a **Failure**, **Primary Cause**, and a **Remedy**; additional options may be required, based on your configuration. Once the required options have been provided, the **Complete Event** button is enabled.
5. Click the **Complete Event** button or select **Complete Event** from the **Actions** menu. The event information is updated, the event is marked as "complete," and the Event Details window closes.

Note: If you do not select the **Failure**, **Primary Cause**, and **Remedy** prior to selecting **Complete Event**, the system will display the Validation Errors and Warnings dialog box that warns you that you must select the missing option(s) in the Completion Actions tab.

Confirm and Restore Outages

If you need to confirm a probable service outage, or confirm a suspected breaker open for a real device outage, you can do this directly by selecting the event in the Work Agenda, right-click, select **Confirm/Restore Outage** submenu, and then select the device operation that will confirm the outage. Similarly, when the outage is restored, you can restore either a service or secondary outage or directly close the breaker.

> **Note:** For more detailed options for confirming outages, use the Confirm Outages window.

Using the Confirm Outages Window

The Confirm Outages window displays a table listing either all of the customers downstream of the predicted or confirmed outage device (when accessed from the Work Agenda) or all of the customers connected to the selected device (when accessed via the Control Tool).

This section includes the following topics:

- Accessing the Confirm Outages Window
- Creating a Confirmed Service Outage
- Creating a Confirmed Secondary Outage
- Creating a Confirmed Service and Secondary Outage for the Same Customer
- Restoring a Customer with a Confirmed Service or Secondary Outage

Accessing the Confirm Outages Window

To access the Confirm Outages window, do one of the following:

- Select **Confirm Outages…** from the Work Agenda **Actions** menu.
- Select a device in the Viewer that has customers connected to it, bring up the Control Tool, then click on the **Confirm Outages…** button.

The Confirm Outages window displays the following columns:

- The **Device** column contains the name of the device the customer is connected to.
- The **Address** column contains the customer's address.
- The **Name** column contains the name of the customer.
- The **Customer Type** column contains the customer type code.
- The **Prediction** column contains the outage prediction type (for example, Confirmed Service, Confirmed Secondary), if available.
- The **Restored** column contains "Yes" to indicate the customer has had their confirmed outage restored.
- The **Grouping** column contains "Yes" if the call for the customer is groupable. The column is empty if there are no calls for the customer or if the call is not groupable.

- The **Event #** column displays the number the system has assigned to the customer's event. If a customer call is made groupable, the event number will change if the call is grouped to an existing or repredicted event.
- The **Call Time** column displays the time when the customer call was received.
- The **Telephone** column contains the customer's telephone number.
- The **Account #** column contains the customer's account number.

The Confirm Outages window contains an **Operations Event Note** text field that allows you to enter comments when service and secondary outages are confirmed and restored.

Understanding the Confirm Outages Window Color Coding

The rows in the Confirm Outages window are color-coded to designate when a customer has a confirmed service outage, a confirmed secondary outage, or when the customer has been restored. When a customer is affected by multiple outages, multiple rows will be displayed representing the different outages.

Color	Description
Green	Confirmed Service Outage
Orange	Confirmed Secondary Outage
Blue	Restored

Confirm Outages Menus and Toolbar

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the print dialog box to allow you to print the current list.	
Refresh	Refreshes the data.	
Exit	Closes the Confirm Outages window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Confirm Service	Confirms a service outage for the selected rows.	--
Confirm Secondary	Confirms a secondary outage for the selected rows	--
Restore	Sets the outage to restored. The Restored column is populated with *Yes*.	--
Make Groupable	Makes the selected call groupable. The **Groupable** column is populated with *Yes*. This option is only available when a row for a customer with a non-groupable call is selected and the call is not part of a confirmed outage.	--
Event Details...	Opens the Event Details window for the selected event, if applicable.	
View...	Shows the associated device in the Viewer.	

Help Menu

Menu Option	Description	Toolbar Icon
Confirm Outages Help	Opens the Confirm Outages online help content.	--

Creating a Confirmed Service Outage

To create a confirmed service outage for a customer, complete these steps:

1. Select the row in the Confirm Outages window for the applicable customer.
2. (Optional) Add an **Operations Event Note**.
3. Select **Confirm Service** from either the right-click option menu or from the **Actions** menu.
4. The Confirm Outages window refreshes. The row for the selected customer is now colored green, and the **Prediction** column is now populated with *Confirmed Service*. A new event row appears in the Work Agenda Trouble Event list. A **CSVO** symbol appears on the customer's device in the Viewer window.

Creating a Confirmed Secondary Outage

To create a confirmed secondary outage for a customer, complete these steps:

1. Select the row in the Confirm Outages window for the applicable customer.
2. (Optional) Add an **Operations Event Note**.
3. Select **Confirm Secondary** from either the right-click option menu or from the **Actions** menu.
4. The Confirm Outages window refreshes. The row for the selected customer is now colored orange and the **Prediction** column is now populated with *Confirmed Secondary*. A new event row appears in the Work Agenda Trouble Event list. A **CSCO** symbol appears on the customer's device in the Viewer window.

Creating a Confirmed Service and Secondary Outage for the Same Customer

To create a confirmed service outage and secondary outage for a customer, complete these steps:

1. Select the row in the Confirm Outages window for the applicable customer.
2. Select **Confirm Service** as described above; the Confirm Outages window will refresh with the confirmed service data. Likewise, with the same row selected, select **Confirm Secondary**.
3. The Confirm Outages window refreshes. There are now 2 rows for the customer with **Prediction** column populated with the outage type (that is, **Confirmed Service** and **Confirmed Secondary**). Both a CSVO and CSCO symbol appear on the customer's device in the Viewer window.

Restoring a Customer with a Confirmed Service or Secondary Outage

To restore a confirmed service or secondary outage for a customer, complete these steps:

1. Select the row in the Confirm Outages for the applicable customer.
2. (Optional) Add an **Operations Event Note**.
3. Select **Restore** from either the right-click option menu or from the Actions menu.

4. The Confirm Outages window refreshes. The row for the selected customer is now colored blue and the **Restore** column is populated with *Yes*. The CSVO/CSCO symbol disappears from the customer's device in the Viewer window (or the CSVO/CSCO numbers are decreased by one).

Setting Work Queues

To add an event to a Work Queue, do the following:

1. Select the desired event's row in the Work Agenda.
2. Click the **Work Queues** toolbar button ( ) or select **Work Queues...** from the **Actions** menu.
3. In the Work Queues dialog box, select the **Refer To** check box for the work queues for the event.
4. Enter any desired remarks into the **Add Note** field.
5. Click the **OK** button. The Work Queues dialog box closes, and the Work Agenda Work Queues column updates with the selected Refer To values.

Understanding Event Grouping

While the system automatically groups events according to the trouble analysis rules, you may come across some events that are related, but are not grouped because of data modeling issues (for example, connectivity problems). You can manually group these events together using the Group Events dialog box.

Group Events Dialog Box

The Group Events dialog box allows you to group events. To open the Group Events dialog box, select **Group Events** from the **Actions** menu in the Work Agenda window.

The Group Events dialog box displays the following fields:

- The **Use First Event As Lead Event** check box, when selected, allows you to set the first event in the list as the lead event when merging. This option is only available when the **Group Method** is **merge**. If not selected, the lead event will be chosen automatically by the system.
- The **Group Events** table displays all of the events that have been selected for grouping. The table contains the following columns:
  - The **Event #** column displays the system assigned event number.
  - The **Status** column displays the event's status. See **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.
  - The **Feeder** column displays the name of the feeder associated with the event.
  - The **Error Message** column displays a description of the error that occurred, if applicable, when the last attempt to group/relate events failed.
- The **Group Method** drop-down list contains a selection of grouping options:
  - The **merge** option is used for event grouping.
  - The **relate** option does not group the selected events, but rather allows you to record a relationship between the events and enter notes in the Relationship Comments field.

- The **unrelate** option allows you to remove one or more previously related events from the relationship.

Note: Selecting different Group Method value clears Error Message column in the Group Events table.

- The **Relationship Comments** field allows you to enter comments about the relationship when the Group Method is set to *relate*.
- The **Clear Errors** button removes rows with grouping errors (where there are error messages in the **Error Messages** column) from the **Group Events** table.

Grouping Events

To group events, complete these steps:

1. Open the **Group Events** dialog box by selecting **Group Events** from the Work Agenda **Actions** menu.
2. Make sure the **Group Method** is *merge*.
3. In the Trouble Events list, select the row for the event that all subsequent events will be grouped to. The event information appears in the Group Events table.
4. Select the row of an event in the Trouble Events list that you want to group to the first selected event. The event information for the event is added to the **Group Events** table.
5. If there are other events you want to add, select the row for those events in the Trouble Events list. The event information for the events are added to the **Group Events** table.
6. To deselect a selected event, select its row again. The event information is removed from the **Group Events** table.
7. Click on the **OK** button.
    - The selected events are grouped to the first selected event.
    - The rows for the subordinate events disappear from the Trouble Events List.
    - The number of customer calls are added together and their sum appears in the # Calls column.

Understanding Grouping Rules

If the events that you selected do not meet the manual grouping rules, the system will not let you group them. An error message will appear in the Error Message column for the offending event. If an error is not related to a specific event, it will be displayed in a separate error dialog. Manual grouping rules include the following:

- General fuzzy events can group to any outage.
- Fuzzy events associated with a control zone can only group to other events in the same control zone.
- Non-outage events can group to outage or non-outage events.
- Outage events can group to other outage events, but outage events cannot be grouped to other outage events that they are not downstream of.
- Real outages (where a device is opened in the Viewer causing a segment of the model to be de-energized) cannot group to one another.
- Outage events cannot group to non-outage events.
- Meets (for example, meet fire, and so on) cannot group to anything.
- Switching events cannot group to anything.

Graphical Grouping (Supply Points Mode)

To add customers to an event graphically, follow these steps:

1. Select a probable outage in the Work Agenda.
2. Click the **Trouble Info** button ( ) or select **Trouble Info...** from the **Actions** menu to display the Trouble Info callers for this outage.
3. Select **Supply Points** from the **File** menu to display the Supply Point Summary.
4. In the Viewer, press the **Supply Points Mode** button to toggle into Supply Points mode.
5. The Supply points of the outage will be highlighted in green; other deselected supply nodes will be in cyan. Using a box or polygon, select a group of supply points. All supply points inside the box or polygon will be highlighted. (See **Selecting Devices** on page 2-74 for details on selecting devices in the Viewer.)
6. Do one of the following:
   - To add a single supply point, right-click on the supply point and select **Add Supply Points** from the context menu. A row is added to the Trouble Info Supply Points table in green and marked as To Be Grouped (TBG).
   - To add all highlighted supply points, hold down the Alt key and right-click on a highlighted supply point, then select **Add Supply Points** from the context menu. The Supply Points rows are added to the Trouble Info Supply Points table in green and marked as To Be Grouped (TBG).

   Note: To display a list of highlighted supply points, Alt-right-click and then select **Show Supply Points** from the context menu. The Supply Point Summary table on the Trouble Info tab displays details for the highlighted supply points.
7. Press the **Update Event** button on the Trouble Info Supply Points view to group the Supply Points into the event.
8. Enter an event grouping threshold (in hours) in the Update Job confirmation dialog box.
   - The selected event will now include the selected supply points and the Work Agenda row will now reflect the new customer count and call count, if other calls existed on the selected Supply Points.
   - Supply Points with calls that did not pass the selected grouping threshold are not added to the outage and will be marked in yellow with FAIL in the Grp column.
   - You can also remove Supply Points from the event by selecting them and clicking the **Remove** button, then the **Update Event** button. Any calls on the removed Supply Points will create new events.

Behavior of Grouped Events

Once events have been manually grouped, the system will no longer repredict the outage device nor will a manually grouped event be automatically merged into another event. However, other events and calls may be automatically merged into a manually grouped event.

Relating Events

To relate events, complete these steps:

1. Open the Group Events dialog box by selecting **Group Events** from the Work Agenda Actions menu.
2. Change the Group Method to relate. The Relationship Comments field is now accessible.
3. Select the rows that you want to relate. The event information appears in the Group Events table.
4. If there are other events you want to add, select the row for those events in the Trouble Events list. The event information for the events are added to the **Group Events** table.
5. Type a comment into the Relationship Comments field, if desired.
6. Click the **OK** button. The selected events are related to one another. The **Grp Type** column in the Work Agenda for each event now contains `REL`, the **Rel Type** column now contains `R`, and **Rel Event #** column now contains the event number of the earliest event.

Unrelating Events

To unrelated events that have been related, complete these steps:

1. Open the Group Events dialog box by selecting **Group Events** from the Work Agenda **Actions** menu.
2. Change the Group Method to unrelate.
3. In the Trouble Events list, select the row for the event that you wish to unrelate. The event information appears in the **Group Events** table.
4. If there are other events that you want to unrelate, select the row for those events in the Trouble Events list. The event information for the events are added to the **Group Events** table.
5. Click the **OK** button. The selected events are unrelated. If two or more events are still part of that relationship, they remain related to each other. If the event that was displayed in the **Rel Event #** column was unrelated and two or more events are still part of that relationship, the **Rel Event #** column is updated with the event number of the earliest event remaining in the relationship.

Ungrouping Events

To ungroup manually grouped events or repredicted upstream device outages, complete these steps:

1. Select a grouped event in Work Agenda.
2. Select Undo Grouping from the Work Agenda **Actions** menu. The event will be ungrouped and new events will be created for the previously grouped events.

   Notes:

   - You cannot ungroup events with crew assignments, whether assigned, en route, onsite, or suspended.
   - If the grouped event was predicted (for example, a Predicted Device Outage (PDO)), it is destroyed and the event number is lost along with any data entered in Event Details.
   - Ungrouped calls are put at the front of the grouping queue and then grouped normally.

Associating and Unassociating Calls with Devices or Control Zones

Sometimes a call comes in reporting a problem that is not clearly related to a particular customer or device. Until a device is identified for the problem, the event is considered a *fuzzy call*. When more information becomes available, you can associate the fuzzy call with a device or control zone. You can also unassociate these calls using the Event Details Trouble Info tab.

Associating Fuzzy Calls

To associate a call with a device or control zone, complete the following steps:

1. In the Work Agenda, select the fuzzy event row.
2. Select **Associate Event...** from the Work Agenda **Actions** menu. The Associate Event dialog box will open.
3. Select the device or control zone that you wish to associate the event to:
   - If you know the device that you want to associate the call to, open the Viewer and load the map containing the device.
   - Select the device in the Viewer. The device identification appears in the **Device** field.
   - If you are associating the fuzzy call to a control zone, select the control zone from the Control Zone selection menu ( ). The control zone name will populate the **Zone** field.
4. Click **OK** to complete the selection in the Associate Event dialog box. The Oracle Utilities Network Management System analysis engine re-analyzes the fuzzy call using the selected associated device or control zone and may group it with other events.

Unassociating/Reassociating a Call from/to a Device

To unassociate a call from one device and reassociate it to another device, complete these steps:

> **Note:** If you are unassociating a call and you want to turn it into a fuzzy call, simply do not select a device to re-associate it with (omit the third and sixth steps below).

1. In the Work Agenda window, select the row for the active event that contains the calls you want to unassociate.

   > **Note:** You cannot unassociate a call from a restored or inactive event.

2. Click the **Trouble Info** button ( ) or select **Trouble Info...** from the **Actions** menu. Call information about the event appears in the Trouble Info window.
3. Open a Viewer window and load the map containing the new device you would like to re-associate the calls with.
4. In the Trouble Info tab, select the row for the call you wish to unassociate from its present device.
5. Select **Unassociate** from the Trouble Info **Actions** menu. The Unassociate dialog box opens.
6. Select a device in the Viewer to populate the New Device field in the Unassociate dialog box.
7. Click **OK**.
   - The call is unassociated from the current device and associated with the new device, if specified.
   - The Oracle Utilities Network Management System Web Trouble analysis engine re-analyzes the event from which the calls were unassociated, as well as the unassociated calls using their new associated device.

Working with Stable Predictions

Stable predicted outages will not be moved to a different device due to incoming calls, device operations, or a user manually repredicting outages. Predicted service and device outages can be made stable.

Stable predicted device outages can consume calls and outages that are downstream from it. Opening a device where a stable predicted device outage is located will convert it into real device outage.

Stable predicted outages can be manually grouped; in that case, a *stable* flag (of the resulting outage) is inherited from the lead outage.

In the **Viewer**, stable predictions have distinct symbology. The symbol for **Predicted Stable Service Outage** contains the text 'PSSO'. The symbol for **Predicted Stable Device Outage** contains text 'PSDO'.

In the **Work Agenda**, a column (**Stable?**) displays the stable status of the outage.

Predicted outages can become stable in the following ways:

- By selecting an outage in **Work Agenda** or **Viewer**, and selecting the **Make Predicted Stable** menu option.
- When a predicted outage remains on the same device for the period of time, which is specified by the **makeStableDelay** configuration rule, it becomes stable automatically.

The stable flag can be removed from a predicted stable outage by selecting the outage in **Work Agenda** or **Viewer**, and selecting the **Remove Predicted Stable** menu option. When the stable flag is removed, the system will reconsider if the outage can be grouped with other outages.

Working with Damage Assessments

The Damage Assessments feature includes summaries of existing damage assessments (displayed in the Event Details Damage Assessments tab) and methods for creating new damage assessments. New damage assessments may be associated with an existing event, a device, or may be created as *fuzzy* events provided that the geographical location of the damage is specified.

Damage assessments include:

- Damage description, such as the location, network section affected, and so on.
- Damaged assets, which can be modeled (present as selectable objects in NMS model) and non-modeled.
- Crew types needed for the repair.

Based on the reported damage, the system will calculate estimated repair time for an event. If multiple damaged assets exist for an event, the system will calculate the estimated repair time by adding together estimated repair times from each active damaged asset. Damage assessment trouble codes have associated clue symbols, which will be displayed in Viewer at the damage locations.

Notes:

- Damage assessment incidents are not included in counts for the event.
- Damage assessment cannot be performed for switching events, fault current events, and meets.

Understanding the Damage Assessment Window

The Damage Assessment window is used to create or edit damage assessment information. The Damage Assessment window is displayed when you do one of the following:

- To create a new *fuzzy* (in other words, not associated to an event) Damage Assessment, select **New** and then **Damage Assessment...** from the Web Workspace **File** menu or clicking the **New Damage Assessment** button ( ) on the Web Workspace toolbar.
- To create a new damage assessment for an existing event, select the event row in the Work Agenda, and then select **Damage Assessment...** from the Work Agenda's **Actions** menu. The Event Details Damage Assessments tab will open. Select **New** from the **Damage Assessments** tab's **File** menu.
- To create a new damage assessment for a device, open the Control Tool for the device to associate with a new damage assessment. Select the Control Tool's **Damage Assessment...** option to open the Event Details **Damage Assessments** tab. Select **New** from the **Damage Assessments** tab's **File** menu.
- To open an existing Damage Assessment, open the Event Details Damage Assessments tab, select the damage assessment in the table, and then select **Open...** from the tab's **File** menu.

Menu and Toolbar Icons

File Menu

Menu Option	Description	Toolbar Icon
Reload	Reloads the data	
Save	Saves changes to the Damage Assessment	
Assessing	The damage is being assessed.	
Assessed	The damage assessment is complete.	
Standing By	The damage is in standby mode.	
Fixed	The damage is fixed.	
Obsolete	The damage assessment is no longer valid.	
Exit	Closes the Damage Assessment window.	--

The Damage Assessment window displays the following fields and buttons:

- The **Damage Assessment #** is the ID of the damage assessment.
- **Event #** is the ID of the event associated with this damage assessment. **0** is displayed if an event has not yet been created for this damage assessment. Once event is created, click the Reload button to populate the field with the event ID.

  The Event Details button ( ) to the right of the field opens the Event Details for the event.
- **Patrol Event #** is the ID of the patrol event associated with the damage assessment, if applicable. The **Event Details** button ( ) to the right of the field opens Event Details for the patrol event; the button is only enabled when the **Patrol Event #** field is populated.
- **Report Date** is the date and time when damage assessment was performed. Click the date-time icon to use the date picker to set the date.
- **Reporting Crew Information**

  These fields represent the crew that reported the damage assessment.
  - The **Reported By** field is the crew that reported the damage.
  - The **Select Crew** button ( ) opens the **Select Crew** dialog box so you can select the crew that reported the damage.
  - **Phone #** is the mobile number of the crew that reported the damage.

- **Assigned Crew Information**

These fields represent the crew assigned to the damage assessment, if different from the Reporting Crew.

- The **Assigned Crew** field is the crew assigned to the damage assessment.
- The **Select Crew** button ( ) opens the **Select Crew** dialog box so you can select the assigned crew.
- **Phone #** is the mobile number of the crew assigned to the damage assessment.

Understanding the Damage Location Section

- **Zone** is the name of the company, region, branch, substation, and feeder.
- **Device** is the device alias of the primary damaged asset.

Actions

- : view the device in the Viewer.

- **Address** is the street address where the damage assessment was performed.
  - Latitude: latitude of the primary damaged asset.
  - Longitude: longitude of the primary damaged asset.

Actions

- : focuses the Viewer on the saved latitude and longitude coordinates.

Action

- : opens the Control Zone selection menu, which allows you to associate fuzzy damage assessment with a control zone. This is only possible during the initial creation of the damage assessment.

Understanding the Damage Specifics Section

- **Section Affected** allows you to specific the section affected by the damage. You can select from a list or enter a value manually.
- **Location** allows you to specify the damage location. You can select from a list or enter a value manually.
- The **Hazard** check box indicates a hazardous situation.
- The **Street Light Damage** check box indicates whether street light damage is reported.
- The Crew Types indicates the types of crews needed to repair the damage. Enter the number of each crew type.
- **Comments** contains any remarks associated with the damage specifics.

Understanding the Damaged Assets Section

- The **Add Damaged Asset** button () opens the Damaged Asset dialog box so you can enter information about the damaged asset. See **Understanding the Damaged Assets Dialog Box** on page 3-54 for details.
- The **Edit Damaged Asset** button () opens the Damaged Asset dialog box so you can edit information about the selected damaged asset. See **Understanding the Damaged Assets Dialog Box** on page 3-54 for details.
- The **Remove Selected Damaged Assets** button ( ) allows you to mark rows in the Damaged Assets table for removal. Rows marked for removal display a red background. The row for the main damaged asset cannot be marked for removal.
- The **Display Attributes of the Damaged Device** button ( ) opens Attributes window displaying device attributes of the selected damaged asset. Disabled if non-modeled asset is selected.
- The **Set as Main Damaged Asset** button ( ) sets the selected damaged asset as the main asset for this damage assessment. This option is disabled if the current main asset or a non-modeled asset without geographical location is selected.
- The **Focus Viewer on the Damaged Device** button ( ) focuses Viewer on the damaged device.
- The **Focus Viewer on Damage Location** button ( ) focuses Viewer on the geographical location of the selected damaged asset.
- The M column displays the main asset indicator.
- Event # displays the event index associated with the damaged asset.
- Device displays alias of the damaged device (only populated for modeled assets).
- **Asset Name** contains the device class description for modeled assets or asset type for non-modeled assets.
- **Status** displays the Open or Closed status for switchable assets; for non-switchable assets, N/A will be displayed.
- **Condition** displays the damage condition, such as Damaged, Down, or OK.
- Phases displays the affected phases.
- **Size** displays asset size. The meaning of size differs depending on the asset type. For example, for a pole, size can be length of the pole in feet, for a fuse, it can be rated current in amps, and so forth.
- **Quantity** displays the number of instances of the damaged asset (for a modeled asset this value is always 1).
- **Truck Accessible** displays flag indicating whether damage location is truck-accessible.
- **Repair Time** displays time needed to repair damaged asset(s).
- **Comments** displays remarks associated with the damaged asset.

Understanding the Damaged Assets Dialog Box

The Damaged Assets dialog box is used to add details about the asset to a new or existing damaged asset definition. The dialog box has the following features:

- The **Asset/Device** mode toggle button. The button allows you to switch between entering information for non-modeled damaged devices or those present in NMS model, respectively.
  - In non-modeled mode, the **Asset** drop-down list allows you to select the type of asset. Available only in asset mode.
  - In modeled mode, the **Device** field allows you to enter the name of the damaged device. A yellow background indicates that the device has not been validated and linked. You may set the device by either searching for the device or linking to a device selected in the Viewer.
    - To enter the modeled asset by name, enter all or part of the device name and click the search button ( ), and then select the device in the **Select Device** dialog box. Select the desired device from the list, and click **OK**.
    - To link to a device selected in the Viewer, click the **Select Modeled Asset** button (). The device ID will populate the **Device** field. Once the device has been selected, the field below it will populate with the device type.
- The **Status** drop-down list allows you to specify the device status (Open/ Closed) for switchable assets.
- The **Condition** drop-down list allows you to specify condition (Damaged/ Down/OK) of the asset.
- The **Phases Affected** check boxes allow you to specify affected phases.
- The **Size** field allows you to enter asset size. This is a free-form text field.
- The **Quantity** field allows you to specify number of damaged instances of this asset type for non-modeled assets. In modeled device mode, this field is not editable and displays the number one (**1**).
- The **Truck Accessible Location** check box allows you to specify whether the damage location is truck-accessible.
- The **Create Separate Event** check box allows you to request that a separate event is created in NMS for this asset. This can only be done for a device with coordinates.
- The **Est Time to Repair (HH:MM)** field allows you to override the repair time calculated by the system for this asset.
- The **Latitude** field displays the latitude coordinate of the damage location.
- The **Longitude** field displays the longitude coordinate of the damage location.
- The **Select Location...** ( ) button opens the Select Damage Location dialog box, which allows you to select the damage location in the Viewer.
- The **Comments** field allows you to enter comments for this damaged asset.

- The **OK** button saves the information entered and closes the dialog box.
- The **Cancel** button discards the information entered and closes the dialog box.

Understanding the Attachments Section

The **Attachments** section allows you to attach a file or link an externally stored file to the damage assessment.

Actions

- The **Add Attachment** button ( )opens the Attach Files dialog box that allows you to attach a file to the damage assessment. Maximum size of the attachment is 50M.
- The **Add Link** button () opens the Add Link dialog box that allows you to add a link to an externally stored attachment that is accessible with an URL. To add a link, complete the following fields:

  Name: a name that is unique to the damage assessment.

  URL: link to attachment.

  Description: short description of the attachment contents.

  Click **OK** to add the attachment link or click **Cancel** to abort the action.

- The **Delete Attachment** button ( ) marks the selected attachments for removal.
- The **Open Attachment** button ( ) opens the selected attachment. Links are opened in a web browser. Files are opened using application associated with the given file type.
- The **Save Attachment** button ( ) saves local copies of the selected attachments.

Table Columns

- **Name:** attachment name (unique within a single damage assessment).
- **File Size:** attachment size in bytes (0 for links).
- **Modified Date:** last modification date for file attachments.
- **Status:** status of the attachment (New, Modified or Deleted).
- **Link:** URL of the externally stored attachment.
- **Description:** attachment description.

Status Bar

The status bar displays the damage assessment status (New, Assessed, Complete, or Obsolete) and the estimated time to repair the reported damage. This is calculated from the information entered in the Damaged Assets table.

Creating Fuzzy Damage Assessments

When a crew reports damage that is not associated with an event in the system, you may create a fuzzy damage assessment and link it to a location in the Viewer. Like with creating an event, you may create a fuzzy damage assessment for an outage or non-outage situation.

1. Open the Viewer to the general location of the damage.
2. Create a new damage assessment by clicking the new **Damage Assessment** button ( ) in the Web Workspace toolbar.
3. On the **Damaged Assets** pane, click the **Add damaged asset...** button ( ) to open Damaged Asset dialog box.
4. Click the location selection button ( ) to open the Select Damage Location dialog box.
5. Click the location in the Viewer where the damage was found. The Select Damage Location dialog box will be populated with the latitude and longitude data from the Viewer.
6. Click **OK** to accept the latitude and longitude.
7. Select the asset type, enter any other available information about the damage assets, and then click **OK**. Add any other known information to the damage assessment and click the **Save** button.
8. Close the Damage Assessment.

When you reopen the damage assessment, click the damage location focus button ( ) to open the Viewer and focus on the saved coordinate data.

Fuzzy damage assessment can be associated to a device by populating the **Device** field with the valid alias (either by entering it directly or selecting device in the Viewer) and then saving the damage assessment.

Working with AMI Requests

This section describes how to work with AMI requests. It includes the following topics:

- Displaying the AMI Requests List
- Creating AMI Requests for Service Outages
- Creating AMI Requests for Device Outages
- Creating an AMI Request Without an Outage
- Completing AMI Requests
- Canceling AMI Requests
- Re-submitting AMI Requests

Displaying the AMI Requests List

To display the complete AMI Requests list, select **AMI Requests List…** from the Web Workspace **Tools** menu.

> **Note:** The AMI Requests list only displays manually generated pings rather than a historical list of auto-pings.

To display the AMI Requests for a particular event. select the event in the Work Agenda, then select **Show AMI Requests...** from the Actions menu.

The AMI Requests List displays the following fields and buttons:

- The **Request #** column is the system-generated index of the request.
- The **Device** column is the outage device.
- The **Feeder** column is the device's feeder.
- The **Substation** column is the device's substation.
- The **Request Date** column is the date the ping was requested.
- The **Request Type** column describes the AMI request (Power, Voltage, or Load Side).
- The **Who Requested** column displays the login user name that initiated the request.
- The **Event #** column is the outage event. The Event # may be empty if meter ping was requested for a device rather than for an event.
- The **# Queried** column is the number of meters pinged.
- The **# Responded** is the total number of responses received to date.
- The **# Off** column is the number of de-energized responses received.
- The **# Connected** column is the number of meters that responded to Load Side request as being connected.
- The **Status** column displays ACT=active, CMP=completed, CNL=canceled.
- The **Complete Date** column displays the date completed.
- The **Who Completed** column displays the login user name that completed the request.

- The **Show Event** button navigates back to the Active Trouble Events List page for the selected row's event.
- The **Resubmit** button resubmits (re-pings) the AMI request.
- The **Complete** button completes the ping request.
- The **Cancel** button cancels the ping request and takes no further action.

Creating AMI Requests

This section includes the following topics:

- Creating AMI Requests for Service Outages
- Creating AMI Requests for Device Outages
- Creating an AMI Request Without an Outage

Creating AMI Requests for Service Outages

To create an AMI request for an existing service outage, follow these steps:

1. Select an existing PSO event in the Work Agenda, then select **AMI Confirm** from the Actions menu. A new AMI request is created for the meter affected by the selected event.

   If you attempt to create an AMI request for a customer that is part of an active AMI request, the AMI Rejected Meters dialog box is displayed. This dialog box lists the customer information associated with the meter that was rejected. Click **OK** to continue.

   Note: You can perform the same action by selecting **AMI Confirm** from the Event Details Trouble Info tab.

Creating AMI Requests for Device Outages

To create an AMI request for an existing device outage, follow these steps:

1. Select an existing device outage in Work Agenda.
2. Select **AMI Confirm** from the Work Agenda **Actions** menu. The Event Details Trouble Info tab is displayed, showing information about customers affected by the selected event.
3. Select customers whose meters should be pinged.
4. Select **AMI Confirm** from the Trouble Info **Actions** menu. A new AMI request is created for the selected meters.

   Note: If you attempt to create an AMI request for a customer that is part of an active AMI request, the AMI Rejected Meters dialog box is displayed. This dialog box lists the customer information associated with the meter that was rejected. Click **OK** to continue.

Creating an AMI Request Without an Outage

To create an AMI request without an existing outage, follow these steps:

1. Double-click on a device in Viewer to bring up Control Tool.

2. Click **AMI Customer List…** in Control Tool. The Event Details Trouble Info tab is displayed, showing information about AMI-enabled customers for the selected event.
3. Select customers whose meters should be pinged.
4. Select **AMI Confirm** from the Trouble Info **Actions** menu. A new AMI request is created for the selected meters.

   Note: If you attempt to create an AMI request for a customer that is part of an active AMI request, the AMI Rejected Meters dialog box is displayed. This dialog box lists the customer information associated with the meter that was rejected. Click **OK** to continue.

Completing AMI Requests

To complete an AMI request, select a row on the AMI Requests list and click the **Complete** button. The options presented to you depend on the status of the original event.

Canceling AMI Requests

To cancel AMI requests, select one or more rows on the Active AMI Requests list and click the **Cancel** button. The canceled AMI requests disappear from the list of active AMI requests. AMI Requests will be automatically expired by the system, as configured by the `meterRequestTTL` SRS Rule (see **Using the Event Management Rules Tab** on page 24-16 for additional information on searching for and editing SRS Rules).

Re-submitting AMI Requests

To resubmit active AMI requests, select one or more rows on the AMI Request list and click the **Resubmit** button. A confirmation window appears, asking whether you want to cancel the active request before submitting the new request. Click **Yes** to confirm.

Updating the ERT for Selected Events

You can set the estimated restoration time for one or more events selected in Work Agenda.

Note: Updating the ERT from the Work Agenda is not allowed for some event types. For Notify Alarms, you cannot set or clear the ERT. For Non Outages, Critical Meets, Future Meets, you can clear the ERT, but cannot set it.

If the ERT update operation cannot be performed on one or more of the selected events, the *Ignored ERT Updates* dialog box will be displayed when the other updates have completed. The *Ignored ERT Updates* dialog box list the events where the ERT was not updated.

To set the ERT for selected events, follow these steps:

1. From the Work Agenda events list, select all the events for which you want to update the ERT.

2. Select **Update ERTs...** from the right-click context menu or the **Actions** menu. The Update ERT dialog box opens.
3. Enter the new ERT using the calendar tool and, optionally, enter an event note.
4. Click the **Set ERT** button. The Update ERT dialog box closes, and the new ERT value is displayed for the selected events in the Work Agenda list.

Clearing the ERT

To clear the ERT for events selected in Work Agenda, follow these steps:

1. Select one or more events in Work Agenda.
2. Select **Update ERTs…** from the right-click context menu or the **Actions** menu. The Update ERT dialog box opens.
3. Double click the displayed time to open the calender tool and select the **Clear** button. Optionally, enter an event operations note and click **OK**. The Update ERT dialog box closes, and the ERT values for the selected events are cleared in the Work Agenda.

Working with the System-Wide Estimated Restoration Time

Setting the System-Wide Estimated Restoration Time

Use this procedure to view and modify the system-wide default ERT value. The system-wide ERT is used for all events; it overrides any default ERTs defined at the control zone/device class level in the Configuration Assistant.

To set the system-wide default, follow these steps:

1. Select **System-Wide Default ERT…** from the Web Work Agenda **Actions** menu. The System-Wide Default ERT dialog box opens.
2. Select **Override All Existing ERTs?** when the new system-wide ERT needs to be applied to all of the ERT sources in the system.
3. Enter a new value in the New System-Wide ERT field, using the calendar tool.

   Note: Only future dates are allowed.
4. Click the **OK** button. The dialog box closes and the specified ERT becomes the default for any new events for which no specific default is specified. All not completed events with an Est Src value of I or N in the Work Agenda will have their ERT values reset to the system-wide default ERT value. If the **Override All Existing ERTs?** check box is selected, then all incomplete events (outages) irrespective of their **Est Src** will have their ERT values reset to the system-wide default ERT value.

   Note: This action causes a full re-examination of all events currently in the system; thus, it is advised to use it sparingly when there are a large number of events present.

Clearing the System-Wide Estimated Restoration Time

Use this procedure to clear the system-wide default ERT value so that all events will use the default values specified for their control zone and device class combination, as defined in the Configuration Assistant. (See **Adding a Device/Zone-Based Default Restoration Time** on page 24-40.)

Note: If you clear the system-wide default ERT and no default ERT has been defined that matches the control zone/device class of an event, the event will not be assigned a default ERT. The ERT will remain empty for the event unless you manually change it.

To clear the system-wide default, follow these steps:

1. Select **System-Wide Default ERT…** from the Web Work Agenda **Actions** menu. The System-Wide Default ERT dialog box opens.
2. Click the **Clear ERT** button. The dialog box closes and the previously specified ERT is no longer used as the default for any new events. The ERT for an event will default to the value defined for its control zone and device class.

   Note: This action causes a full re-examination of all events currently in the system; thus, it is advised to use it sparingly when there are a large number of events present.

Using the Trouble Summary

The Trouble Summary provides outage, patrol assessment, and damage summary information by control zone.

Menus and Toolbars

File Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshes the data in the Trouble Summary window. **Note:** When the **Use Current Time** option is checked, the Trouble Summary window will automatically refresh at predefined intervals.	
Print All...	Prints the outage summary and damage summary data for the selected region.	
Print Outage Summary...	Prints the outage summary data.	
Print Damage Summary...	Prints damage summary data for the selected region.	
Trend Graph...	Opens an outage trend graph for the selected control zone.	
Exit	Closes the Trouble Summary window.	--

Help Menu

Menu Option	Description	Toolbar Icon
Trouble Summary Help...	Opens the online help system to the Trouble Summary help content.	--

Outage Summary Data

The Outages Summary pane provides information about outage overview information that you may drill down by region.

Outages Summary data includes:

- The **Est Restore Time** column contains the estimated restoration time (ERT) for events in that region.
- The **Feeders Out** column contains the number of outages on feeder breaker devices.
- The **# Customers** column contains the total number of customers experiencing an outage for the region.
- The **# Critical** column contains the total number of critical customers experiencing an outage for the region.
- The **# Calls** column contains the total number of customer calls received for the region.
- The **# Service Outages** column contains the total number of service outages for the region.
- The **# Device Outages** column contains the total number of device outages for the region.
- The **# To Do Outages** column contains the total number of outages that do not have a crew en route or onsite.

The Outage Summary information may be based on the current time or a user selected time; the **Summary Time** is the time when summary information was generated within the chosen time parameter. To select a date and time parameter, deselect **Use Current Time** and click the **Display Outages Summary As Of** button ( ) and pick your desired date and time.

Damage Summary Data

The Damage Assessment information includes aggregate data from damage assessments. The Damage Summary pane is only visible when **Use Current Time** is checked. The section, which is populated when a row in the Outages Summary is selected, includes the following data for the given region:

- **Zone:** control zone name.
- **Crew Type:** If selected, filters the three Damage Summary tables based on damage assessments needing the selected crew type.
- **Work Queue:** If selected, filters the three Damage Summary tables based on events containing the selected work queue.
- **Total Repair Time (HH:MM):** Total amount of time needed to repair the damage reported for the selected control zone.
- **Required Crews:** Provides information about the crew requirements.
  - **Crew Type:** Lists the crew types needed.
  - **# Needed:** Number of crews needed for the given type.

- **Damaged Assets:** Lists reported damaged assets.
  - **Asset Name:** The name of the asset.
  - **# Accessible:** Number of accessible instances of the damaged asset.
  - **# Inaccessible:** Number of inaccessible instances of the damaged asset.
- **Comments:** Provides damage assessment comments.
  - **Event #:** The event numbers associated with the damage assessment comments.
  - **Crew:** Identification of the crew that made the damage assessment comments.
  - **Damage Comment:** Text from the Damage Assessment Damage Specifics **Comments** field.
  - **Assets Comment:** Text from the Damage Assessment Damaged Assets **Comments** field.
- **# Load Affected:** Number of damage assessments having damaged assets with Open status.
- **# Street Lights Damaged:** Number of damage assessments having Street Lights Damaged.
- **# Road Blocked:** Number of damage assessments reporting blocked roads.
- **# Hazardous:** Number of damage assessments reporting hazardous conditions.

Assessment Summary Data

The Assessment Summary information includes the count of the number of assessment conditions in the selected control zone (Patrolling Assessments, Device OK Assessments, and All OK Assessments). Next to each row in the report is a **Delete** icon ( ) that allows you to delete the assessments of that type for the selected control zone and date filter is used.

The Miles of Conductor Assessed row shows the ratio of conductor miles marked as assessed versus total conductor miles in the control zone, and the calculated percentage. You may clear the marked assessments for the selected control zone by clicking the **Delete** icon ( ).

Understanding the Trend Graph

Menus and Toolbar Icons

File Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshes the data in the Trend Graph window with the selected control zone's data.	
Print...	Prints the trend graph for the selected region.	
Exit	Closes the Trend Graph window.	--

Help Menu

Menu Option	Description	Toolbar Icon
Graph Tool Help...	Opens the online help system to the Trend Graph help content.	--

The trend graph displays a summary of customers, calls, and outages over a given period of time. The graph does not automatically update, but can be updated by clicking the refresh toolbar button or selecting **Refresh** from the **File** menu. If you wish to see data for a different row in the Trouble Summary, click the Trend Graph Tool button and the Trend Graph window will update.

Chapter 4

Managing Crews with Web Trouble Management

This chapter describes the Oracle Utilities Network Management System Web Trouble module's crew management functionality. The Web Workspace crew dispatch and management functions facilitate operations in daily maintenance and outage restoration situations.

Oracle Utilities Network Management System – Web Trouble allows you to manage crews efficiently. This section describes the various windows and functions that relate to managing crews. It includes the following topics:

- Using Crew Actions
- Using Crew Makeup
- Managing Crew Operations
- Using Crew Info

Using Crew Actions

Use the Crew Actions window to view and manage crews. The Crew Actions window opens by default when you log in to Oracle Utilities Network Management System Web Workspace. It is displayed below the Web Work Agenda window. You can also display this window by selecting **Crew...** from the Web Workspace **Tools** menu.

The Crew Actions window displays a Menu and Toolbar and provides two views: Understanding the Crew List View and Understanding the Crew Icons View.

Crew Actions allows you to perform crew and event operations. These operations are described in the following sections.

- Activating a Crew
- Setting a Crew's Status to On Shift
- Setting a Crew's Status to Off Shift
- Making a Crew Inactive
- Deleting a Crew
- Changing Crew Availability
- Finding the Event a Crew is En Route To
- Transferring a Crew to a Temporary Control Zone

Understanding the Crew Actions Window

Menu and Toolbar

The Crew Actions window displays a toolbar and menu bar, as described in the following tables.

File Menu

Menu Option	Description	Toolbar Icon
New...	Opens the Crew Makeup window, which allows you to define a new crew.	
Delete	Deletes the currently selected crew after prompting for confirmation. This is enabled only if an inactive non-mobile crew is selected.	
Export Table...	Opens a dialog box to allow you to save the current table view data to a comma separated value (csv) file.	
Exit	Closes the Crew Actions window.	--

View Menu

Menu Option	Description	Toolbar Icon
Icons	Switches to the Icons view if the List view is currently active.	--
List	Switches to List view if Icons view is currently active.	--

Filter Menu

Menu Option	Description	Toolbar Icon
Shift Status	Filters by shift statuses. The product environment includes the following shift options: • All • On Shift • Off shift • Inactive	--
Job Status	Filters by job statuses. The product environment includes the following job status options: • All • Available • Assigned • En Route • Onsite • Suspended • Unavailable • None	--
Crew Type	Filters by crew types. The product environment includes the following crew type options: • All • Service • Trouble • Tree Crew • Line • Eval	--
Event Zone	Filters crews by the zone of the event selected in the Work Agenda. The product environment includes the following event zone options: • All • Region (Control Zone Hierarchy Level 2) • Branch (Control Zone Hierarchy Level 3)	--
Parent Zones	Filters crews by parent Control Zone. • Include - Display crews created for zones that are parents of the subscribed zones. • Exclude - Excludes crews created for zones that are parents of the subscribed zones.	
All Zones	Displays crews in all control zones. When checked, the Parent Zones and Event Zones options are disabled.	

Actions Menu

Menu Option	Description	Toolbar Icon
Edit...	Opens the Crew Makeup window, which allows you to edit the currently selected crew. This is enabled only if a non-mobile crew is selected.	
Crew Info...	Opens the Crew Info dialog box for the selected crew.	
Switching...	Opens the switch plan to which the selected crew is associated. This is enabled only if a crew is selected and Web Switching Management is licensed for your system. If more than one plan is associated with the crew, a dialog box prompts you to select one.	--
View…	Opens Viewer 1, focused on the device where the selected crew is en route or onsite, and selects event in the Work Agenda Event List to which the crew is en route or onsite. This is enabled only if an en route or onsite crew is selected.	
Locate Crew...	Displays the selected crew in the Viewer window at the current coordinates of the crew. This option is available only for crews with AVL (Automatic Vehicle Location) systems.	--
Availability...	Opens the Update Crew Availability dialog box for the selected crew. See **Changing Crew Availability** on page 4-9.	
Assign	Assigns the selected crew to the event currently selected in Work Agenda.	
Assign All Related	Assigns the selected crew to the selected event and all related events.	
En Route	Puts the selected crew en route to the event currently selected in Work Agenda. This is enabled only if the selected crew is an on-shift, available, non-mobile crew that is not currently en route or onsite.	
Onsite	Puts the selected crew onsite at the event currently selected in the Work Agenda. This is enabled after the crew is en route.	
Toggle Mobile On	Turns off override for a crew that is currently overridden by the Toggle Mobile Off action.	--
Toggle Mobile Off	Overrides the selected crew to act as a non-mobile crew. Enabled if an active off shift mobile crew is selected. Not available to view only users.	--
Activate	Activates the selected crew. This is enabled only if an inactive non-mobile crew is selected.	--
Deactivate	Deactivates the selected crew. This is enabled only if the selected crew is an off-shift, active non-mobile crew that has no assignments.	--

Menu Option	Description	Toolbar Icon
Set On Shift...	Opens a dialog box that allows you to enter an on-shift time for the selected crew. This is enabled only if an off-shift active crew is selected.	--
Set Off Shift...	Opens a dialog box that allows you to enter an off-shift time. This is enabled only if the selected crew is an on-shift crew that is not en route or onsite.	--
Transfer Zone...	Temporarily transfer the crew to a different control zone.	--
Release Temporary Zone	Return the crew from its temporary control zone assignment back to its original control zone.	--

Filtering Crew Lists

Crews may be filtered in either of the Crew Actions views (that is, List or Icons). Filters may be applied in any of the following ways:

1. **Filter Menu Options**
    - Choose any combination of options from the Shift Status, Job Status, and Crew Type to view only those crews meeting the criteria.
2. **List View Dynamic Filtering**
    - Enter filter criteria in the List View Dynamic Filter field at the top of each column in the crew table.
3. **Filter by Work Agenda Event Criteria**
    - Select an event zone option from the **Event Zone** submenu of the Crew Actions **Filter** menu.
    - Select one or more events in the Work Agenda that are in a control zone.
    - The Crew List will display only those crews assigned to the control zone.

    Note: If you select multiple rows in the Work Agenda that cross multiple control zones, the Event Zone filter will be removed from the Crew List or Crew Icons views. Once you select a single row or rows with events in the same control zone, the filter will be re-enabled automatically.

Understanding Crew Actions Views

Understanding the Crew List View

The Crew Actions **List** view displays a table containing the crew list. When one or more crew rows are selected, a right-click context menu allows you to choose from the actions available for any of their assigned events. If one or more events are selected, actions to assign the crew or place them en route will be shown. The right-click context menu will only show valid options for the crew; for example, if multiple events are selected, then the en-route crew option may not be available since most crew types cannot be en-route to multiple events.

The crews that appear in the list are based on the current filter settings. See **Crew Status** on page D-1 for a list of color codes used to indicate crew status.

The Crew List contains the following fields and buttons:

- The **Control Zone** column contains the name of the control zone the crew is assigned to.
- The **Crew ID** column contains a string that identifies the crew.
- The **Crew Type** column contains the type of crew (for example, Eval, Service, Line, and so on).
- The **Contact** column contains the contact name for the crew.
- The **Event #** column lists the events that the crew is either assigned, en route, or onsite.
- The **Mobile #** column contains the primary phone number for the crew.
- The **Alternate #** column contains the alternate phone number for the crew.
- The **Crew Size** column contains the number of crew members.
- The **Feeder** column contains the feeder for the device where the crew is en route/onsite.
- The **Device** column contains the name of the device where the crew is en route/onsite.
- The **Est Restore Time** column contains the date and time when the event where the crew is en route/onsite is estimated to be restored.
- The **# Assign** column contains the number of events assigned to the crew.
- The **Hours Worked** column contains the length of time the crew has been active.
- The **Mobile** column indicates whether this is a mobile crew.
- The **Shift Status** field displays the crew's current shift status. Valid statuses are:
  - Inactive
  - Off Shift
  - On Shift
- The **Job Status** field displays the crew's current job status. Valid statuses are:
  - Available
  - En Route

- Onsite
- Suspended
- Unavailable

Understanding the Crew Icons View

The Crew Actions Icons view displays buttons to represent each crew. When one or more crew icons are selected, right-click to show the actions that are allowed for any event that the crew is currently assigned to. In addition, if one or more events are selected in the Work Agenda, actions to assign or place the crew en route to the events will also be available. The right-click context menu will only show valid options for the crew; for instance, if multiple events are selected, then the en-route crew option may not be available since most crew types cannot be en-route to multiple events.

Note: The **Actions** menu can also be used for crew changes.

As the crew's status changes, a symbol will be added to the button that depicts the current status; see **Event Status Codes** on page C-1 for the symbol icons that correlate to each status. See also **Crew Status** on page D-1 for a list of color codes that may be used to indicate crew status when cell or row coloring is enabled in the Web Workspace **Preferences** menu.

Understanding Crew Actions Operations

Activating a Crew

Crews are activated by changing their status from **Inactive** to **Active**, which indicates that they are available for work.

To activate a crew, complete these steps:

1. In the Crew Actions window, select the inactive crew you want to activate.
2. Select **Activate** from the **Actions** menu. (In List view, you can also right-click the crew and then select **Activate** from the context menu.) The status changes to Off Shift.

   Note: You cannot activate a crew if its Mobile is Yes. You must choose the **Toggle Mobile Off** option on the Actions menu to change the mobile status before activating. The Mobile Flag columns displays No (Override), indicating that the crew's mobile status has been manually overridden.
3. You can now set the crew's status to On Shift. See Setting a Crew's Status to On Shift.

Setting a Crew's Status to On Shift

Setting an active crew's status to On Shift indicates that the crew has started working the shift and sets the time the crew went on shift. You can only set a crew's status to On Shift if its current status is Active.

To put a crew On Shift, do the following:

1. In the Crew Actions window, select the active crew you want to put On Shift.

2. Select **Set On Shift...** from the **Actions** menu. (In List view, you can also right-click the crew and then select **Set On Shift...** from the context menu.) The Set Crew On Shift dialog box opens.
3. The Set Crew On Shift dialog box opens with the **On Shift Time** field showing number signs (#) rather than values for date and time. The date and time may be added by performing one of the following options.
    - To set the On Shift Time to the current time, click **OK**.
    - To specify a different time:
        - Click the date/time button ( ) to expand the date/time selector.
        - In the date/time selector, select the date/time the crew went on shift, and click **OK**. The selector will be minimized and the **On Shift Time** field will be populated with the selected date/time.
        - In the Set Crew On Shift dialog box, click **OK**.

Setting a Crew's Status to Off Shift

Setting an active crew's status to **Off Shift** indicates that the crew has stopped working the shift and sets the time when the crew went off shift. You can only set a crew's status to Off Shift when its status is On Shift.

To put a crew Off Shift, follow these steps:

1. The Set Crew Off Shift dialog box opens with the **Off Shift Time** field showing number signs (#) rather than values for date and time. The date and time may be added by performing one of the following options.
    - To set the Off Shift Time to the current time, click **OK**.
    - To specify a different time:
        - Click the date/time button ( ) to expand the date/time selector.
        - In the date/time selector, select the date/time the crew went off shift, and click **OK**. The selector will be minimized and the **Off Shift Time** field will be populated with the selected date/time.
        - In the Set Crew Off Shift dialog box, click **OK**.

Making a Crew Inactive

You can deactivate a crew to indicate that it is not available for work. You can only deactivate a crew if its status is Active or Off Shift and it has no current assignments.

To deactivate a crew, complete these steps:

1. In the Crew Actions window, select the active or off shift crew you want to deactivate.
2. Select **Deactivate** from the **Actions** menu. (In List view, you can also right-click the crew and then select **Deactivate** from the context menu.) The status changes to Inactive.

Deleting a Crew

To delete a crew, complete these steps:

> **Note**: You can only delete a crew if it is inactive. You cannot delete a mobile crew, even if the mobile flag has been overridden.

1. If the crew is active, you must first deactivate it (see Making a Crew Inactive). If a crew is on shift, you must first set the crew to off shift (see Setting a Crew's Status to Off Shift) and then deactivate it before you can delete it.
2. Select the crew in the Crew Actions window.
3. Select **Delete** from the **Actions** menu. (In List view, you can also right-click the crew and then select **Delete** from the context menu.) A dialog box prompts you to confirm the deletion.
4. Click **OK**. The crew is deleted from the system.

Adding a Note to the Event

You can add a note to any event that crew is assigned to.

Updating the Estimated Restore Time

You can update the Estimated Restore Time for any event that crew is assigned to using a simple display, and optionally add a note to the event at the same time.

Changing Crew Availability

Making a crew available/unavailable is different from making it active/inactive. You can assign an unavailable crew, but you cannot place it en route. See Activating a Crew and Making a Crew Inactive for more information on active/inactive crews.

To change a crew's availability, complete these steps:

1. Select the crew you want to change in the Crew Actions window. You cannot change an en route/onsite crew.
2. Select **Availability…** from the **Actions** menu. (In List view, you can also right-click the crew row and select **Availability...** from the context menu.) The Update Crew Availability dialog box opens.
3. Select the appropriate option to change the crew's availability.
   - **Available** button to make the crew available
   - **Unavailable** to make it unavailable

   If you are making an available crew unavailable, select the **Description** field and add a brief reason for the change (for example, on break).

   > **Note:** The description text is shown in the description field until you set the crew back to available.

4. Click **OK** to confirm your change or **Cancel** to abort the action.

If the crew has been made unavailable, the Crew ID will be displayed in yellow as will the crew icon.

> **Note:** You can assign events to both available and unavailable crews.

Finding the Event a Crew is En Route To

To find the event a crew is en route to, select the crew in the Crew Actions window and then select the **View** toolbar button or select **View...** from the **Actions** menu. The event row is highlighted in the Work Agenda Trouble Events list, and Viewer 1 focuses on the device associated with the en route event.

> **Note:** The Work Agenda event row will only be highlighted if the Work Agenda window is open and the event is on the list you currently have displayed in the Work Agenda window. The Viewer will only focus on the device if you have the Viewer 1 window open.

Transferring a Crew to a Temporary Control Zone

To transfer a crew to a temporary control zone, perhaps to offset a crew shortage in the zone, compete these steps:

1. Select the crew to transfer control.
2. Select **Transfer Zone...** from the Actions menu.
3. Select a control zone in the Transfer Crew Zone dialog box.
4. Click **OK** to complete the transfer.

Returning Control of a Transferred Crew

To return control of the crew to their usual control zone, compete these steps:

1. Select the crew from the crew list.
2. Select **Release Temporary Zone** from the Actions menu.

The crew list will update to show that the crew's control zone has reverted to their permanent assignment.

Using Crew Makeup

To open the Crew Makeup window, select **New**... or **Edit**... from the Crew Actions **File** menu or toolbar.

Understanding the Crew Makeup Window Components

The Crew Makeup Window displays the following fields and buttons:

- **Fields**
  - The **Crew ID** field displays the alphanumeric ID that identifies the crew.
  - The **Mobile #** field displays the crew's mobile telephone or radio number.
  - The **Mobile Carrier** field displays the wireless company providing service to the mobile phone or radio.
  - The **Alternate Number** field displays an alternate number for the crew.
  - The **Alternate Number Type** field displays the crew's alternate number type (for example, home, personal mobile, and so on).
  - The **Pager #** field displays the pager number.
  - The **Contact** field displays the Name of the contact person for the crew.
  - The **Crew Size** field displays the Number of members of the crew. The crew size is initially set to zero.
  - The **Type** drop-down list allows you to select the type of crew (for example, Line, Eval, Trouble).
  - The **Temp/Perm** drop-down list allows you to define the crew as either temporary or permanent. When a crew is set to temporary, you would normally delete it when it is deactivated.
  - The **Control Zone** field displays the control zone that the crew is assigned to. When you click the **Edit…** button, a Control Zone dialog box opens letting you assign the crew to a control zone.
  - The **Personnel** list displays information about each crew member. You can add crew members by clicking the **Add…** or **Select Personnel…** buttons. You can remove a crew member by selecting their row in the **Personnel** table and clicking the **Remove** button.
  - The **Vehicles/Equipment** list displays the vehicles or equipment assigned to the crew. You can add vehicles or equipment by clicking the **Add…** or **Select Vehicles/Equipment…** buttons. You can remove a vehicle or piece of equipment by selecting the item and clicking the **Remove** button.
- **Buttons**
  - The **OK** button saves the crew changes and closes Crew Makeup.
  - The **Cancel** button closes Crew Makeup without saving any changes.

Creating a New Crew

To create a new crew, complete these steps:

1. Open the Crew Makeup window by selecting **New**... from the Crew Actions **File** menu or toolbar.
2. Enter the Crew ID, mobile number, mobile carrier, alternate number, alternate number type, pager number, and contact.
3. Select the crew type and whether they are temporary or permanent from the respective drop-down lists.
4. Click the **Edit…** button to open the Control Zone dialog box. Select a control zone and click **OK**.
5. Check the **Mobile App Crew** if this crew should be available to all mobile users.
6. Click the **Add…** (Personnel) button to open the Add Personnel dialog box. Enter a crew member's name and select their job title, then click **OK**.

   Or

   Click the **Select Personnel…** button to open the Select Personnel dialog box. Select one or more rows from the Select Personnel dialog box (using the Control and/or Shift keys), then click **OK**.
7. Repeat the previous step until all crew members are added.
8. Click on the **Add…** (Vehicles/Equipment) button to open the Add Vehicle/ Equipment dialog box. Select the vehicle type, and then click **OK**.

   Or

   Click the **Select Vehicles/Equipment…** button to open the Select Vehicles/ Equipment dialog box. Select one or more rows from the Select Vehicles/Equipment dialog box (using the Control and/or Shift keys), then click **OK**.
9. Repeat the previous step until all vehicles are added.
10. Click **OK** on the Crew Makeup dialog box to create the crew.

Removing Personnel from a Crew

To remove an individual from a crew that you have open in Crew Makeup, select his or her name in the Personnel list and click **Remove**. The name disappears from the Personnel list.

Removing a Vehicle from a Crew

To remove a vehicle from a crew you have open in Crew Makeup, select the vehicle from the Vehicles/Equipment list and click **Remove**. The vehicle disappears from the Vehicles/Equipment list.

Editing a Crew

To edit a crew, complete these steps:

1. Open the Crew Makeup window by selecting **Edit...** from the Crew Actions **File** menu or toolbar.
2. Make the changes to the crew.
3. Click **OK** on the Crew Makeup dialog box to save the changes.

Managing Crew Operations

Associating crews with events and updating the crew status (from assigned through en-route, onsite, offsite, suspend and released) can be done from both the Crew Actions and Work Agenda windows. A right-click context menu provides the available options for the given event/crew combination.

The only time that an event and a crew must both be selected is when initially assigning a crew to an event. From an event in the Work Agenda, you can update the status of any crew currently assigned to that event. If a single crew is assigned to an event, then the available options are shown directly in the menu; if there are multiple crews assigned to the event, a submenu will be shown for each crew. Similarly, from a Crew in the Crew Actions window, you can update the status of that crew on any event that the crew is currently assigned to. If a crew is only assigned to a single event, then the available options are shown directly in the menu; if a crew is assigned to multiple events then a submenu will be shown for each event.

The following actions can be performed from the menu in either window

- Assigning a Crew to an Event
- Placing a Crew En Route
- Placing a Crew Onsite
- Placing a Crew Offsite
- Suspending a Crew
- Releasing a Crew

Assigning a Crew to an Event

Assigning a crew adds the event to the crew's work queue.

> **Note:** You do not have to assign a crew to an event before placing it en-route. Assigning merely lines up the event for the crew to work later.

To assign a crew to an event, complete the following steps.

1. In the Work Agenda Trouble Events list, select the row containing the event that you want to assign the crew to.
2. Select the crew you want to assign the event to in the Crew Actions window.
3. Right click and select **Assign**.

> **Note:** You can assign multiple events to a single crew. You can also assign multiple crews to a single event.

Placing a Crew En Route

To place a crew en route to an event, complete these steps:

> **Note:** You can only place a crew en route to an event if the crew is an on-shift, available, non-mobile crew that is not currently en route or onsite to an event.

If the crew is already assigned to the event:

1. With a single event selected in the Work Agenda, select a crew.
2. Right click to display the context menu. The actions available depend on whether the crew is assigned to just one event or assigned to multiple events. If they are assigned to multiple events, a submenu will be provided for each event that the crew is assigned to.
3. Select **En Route** for the selected event.

If the crew is not already assigned to the event:

1. In the Work Agenda Trouble Events list, select the row containing the event that you want to place the crew en route to.
2. In Crew Actions, select the crew you want to place en route.
3. Right click and select **Add Crew to Event**.
4. Right click and select **En Route**.

> **Note:** You can place multiple crews en-route to a single event.

Placing a Crew Onsite

To place a crew onsite to an event, complete the following steps:

If the crew is already en route to the event:

1. Select the crew.
2. Right click and select **Onsite** from the event options.

> **Note:** If the crew is not assigned to the event, follow the steps in Placing a Crew En Route first.

Placing a Crew Offsite

To place a crew Offsite to an event, complete these steps:

If the crew is already on site at the event:

1. The right click context menu will display the allowed options for the Crew.
2. Select **Offsite** for the selected event.

Suspending a Crew

Suspending a crew for an event allows a crew to be placed en route or onsite to a different event without completely releasing the crew from the first event.

To suspend a crew that is en route to or onsite at an event, complete these steps:

1. Select the crew.
2. Right click and select **Suspend** for the selected event.

Releasing a Crew

To release a crew (unassign) from an event, complete these steps:

1. Select the crew.
2. Right click and select **Release** for the selected event.

Crew Operations Using the Advanced Option

In addition to the standard **Assign**, **En Route**, and **Onsite** options, there is also an **Advanced...** action that allows those actions to be performed with a modified time and an optional event note. You can use this action to adjust the time a crew operation is logged as performed, which supports more accurate travel time and Estimated Restore Time (ETR) calculations, if required.

Using Crew Info

Crew Info displays detailed crew information not shown in Crew Actions window. It allows you to unassign a crew or place a crew en route to any of its assigned events.

Crew Info topics include:

- Opening Crew Info
- Understanding Crew Info Window Components
- Working with Crew Assignments

Opening Crew Info

To open the Crew Info window, do the following:

1. Select the crew:

- From the Crew Actions List view, select the row of the crew you want to view.
- From the Crew Actions Icons view, select the icon of the crew you want to view.

2. Click the **Crew Info…** button ( ) or select **Crew Info...** from the **Actions** menu.

Understanding Crew Info Window Components

Menus and Toolbar Icons

File Menu

Menu Option	Description	Toolbar Icon
Exit	Closes the Crew Info window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Change Assignment Duration...	Change the duration for an event assigned to the crew.	
Drop Assignments	Unassign the crew from the selected assignment.	
Place En Route	Place the crew en route to selected assignment.	
Place Onsite	Places the crew onsite for the selected assignments. **Note:** This option is only available for crews configured for `allow_direct_onsite` in the CREW_TYPES table.	
Transfer Zone...	Opens the Transfer Zone dialog box, which allows you to assign the crew to a temporary zone.	--
Release Temporary Zone	Removes the temporary zone assignment.	--

Help Menu

Menu Option	Description	Toolbar Icon
Crew Info Help	Opens the online help system to the Crew Info help content.	--

Understanding Crew Info Fields and Buttons

The Crew Info window contains the following fields and buttons:

- The **Crew ID** field displays the string that identifies the crew.
- The **Mobile #** field displays the crew's mobile phone number.
- The **Mobile Carrier** field displays the wireless company providing service to the mobile phone or radio.
- The **Alternate Number** field displays an alternate number for the crew.
- The **Alternate Number Type** field displays the crew's alternate number type (for example, home, personal mobile, and so on).
- The **Pager #** field displays the crew's pager number.
- The **Contact** field displays the name of the crew's contact person.
- The **Type** field displays the type of crew (for example, Eval, Service, Line, and so on).
- The **Temp/Perm** field displays whether the crew is a temporary crew or a permanent crew.
- The **Control Zone** field displays the control zone the crew is assigned to.
- The **Status** field displays the crew's current status. Valid statuses are:
  - Inactive
  - Off Shift
  - On Shift
- The **Mobile Flag** field indicates whether this is a mobile crew.
- The **Out of Range** field indicates whether the crew is currently out of range (no connectivity).

Understanding the Crew Info Personnel Section

- The **Name** column displays the names of all the crew members.
- The **Job Title** column displays the job titles of all crew members.
- The **Empl ID** column displays the employee ID of all crew members.
- The **OMA - Last Connected** column displays the number of hours and minutes that the crew has been connected to OMA. If not connected, the column will be blank.
- The **OMA Login Duration** column displays how long the OMA crew has been logged in.

Understanding the Crew Info Vehicles/Equipment Section

- The **Type** field displays the vehicle types assigned to the crew.
- The **Vehicle ID** column displays the ID of all vehicles assigned to the crew.

Understanding the Crew Info Active Jobs Section

The Active Jobs pane provides basic crew information, as well as information for the event where they are en route to/onsite at. It allows you to move and release crews. You can also use the Active Jobs pane to record that a crew has arrived onsite, to enter an estimated restoration time, and add an operations event note.

Components of the Active Jobs Pane

- The **Est Restore Time** field displays the date and time when the event that the crew is en route/onsite is estimated to be restored. This time can be edited using date/time actions (see **Using Date/Time Pickers** on page 1-5). Select the **Clear** button to remove the Estimated Restore Time time (Clear ERT).
- The **Onsite/Not Onsite** drop-down list allows you to designate whether the crew has arrived onsite or not. The date/time field (to the right) populates with the current time when you set the crew to **Onsite**. You may use the calendar button ( ) to specify a different time. Validity checking is performed on the entered time and any time before the crew was set En-Route or after the current time will be flagged as an error.
- The **Suspend/Not Suspend** check box indicates whether the crew is suspended. To suspend the crew, click the check box. The date/time field (to the right) populates with the current time when you check the box. The date/time field populates with the current time when you check the box. You may use the calendar button ( ) to specify a different time, any valid time sets the drop-down to **Suspend** and clearing the time sets the drop-down to **Not Suspend**. Validity checking is performed on the entered time and any time before the crew was set En-Route or after the current time will be flagged as an error.
- The **Operations Event Note** field allows you to enter new or modify existing notes about the event.
- The **Active Jobs** table displays information about the event that the crew is en route to or onsite at, if applicable. The table contains the following information.
  - The **Event #** column displays the event number of the event that the crew is currently en route to or onsite at, if applicable.
  - The **Crew Status** column displays the status of the crew for this event (En Route or Onsite).
  - The **Est Restore Time** column displays the date and time when the event that the crew is en route/onsite is estimated to be restored.
  - The **Feeder** column displays the name of the feeder for the device where the crew is currently en route/onsite, if any.
  - The **Device** column displays the name of the device related to the event.
  - The **# Calls** column displays the number of calls for the event.
  - The **# Out** column displays the number of customers out for the event.
- **Button Section**
  - The **Apply** button saves the changes you have made.
  - The **Move Crew…** button opens the **Choose Work Location** dialog box where you enter the location you want to move the crew to by selecting a device in the Viewer.

- The **Release Crew** button releases the crew from the event.

Note: If you moved the crew, the change is still saved.

Understanding the Crew Info Current Assignment Section

- The **Event #** column contains the event number of the event the crew is assigned to.
- The **Duration** column displays the estimated amount of time that the crew will be assigned to the event. The system default duration is one hour.
- The **Assign Time** column contains the time when the crew was assigned to the event.
- The **Feeder** column contains the name of the feeder involved in the event.
- The **Device** column contains the name of the device related to the event.
- The **# Calls** column contains the number of customer calls received for the event.
- The **# Out** column contains the estimated number of customers experiencing an outage for the event.
- The **Dispatch Time** column contains the time when the crew was dispatched to the event.

  Note: In the NMS product configuration, the **Assign Time** and **Dispatch Time** will be the same. Implementations may use a two step assign and dispatch that will result in different values in the **Assign Time** and **Dispatch Time** columns.
- The **Suspended** column indicates whether the assignment was suspended.

Understanding Current Assignments Context Menu Options

When you right-click an assignment row, the following context menu options are available:

- The **Change Assignment Duration...** option opens the Change Assignment Duration dialog box, which allows you to change the duration value. See **Modifying a Crew Assignment Duration** on page 4-21 for details.
- The **Drop Assignment** option removes the selected event from the list of crew assignments.
- The **Place En Route** option places the crew en route to the selected event. Once the crew has been placed en route, the event will be displayed in the **Crew Info Active Jobs** table.

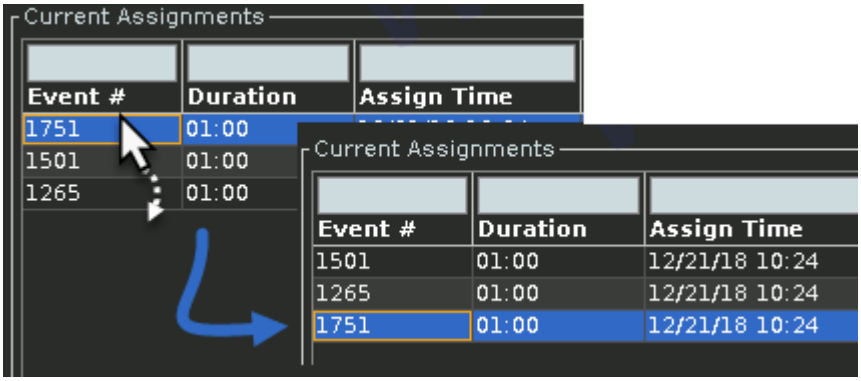
Working with Crew Assignments

Modifying a Crew Assignment Duration

1. In Crew Info, select the event from the Current Assignments table. The buttons at the bottom of the window become enabled.
2. Select **Change Assignment Duration...** from the Crew Info **Actions** menu.
3. Enter the new duration in hours and minutes (HH:MM); for example, 01:30 for a new duration of one hour and 30 minutes.
4. Click **OK** to close the dialog box.

Changing the Crew Assignment Order

1. In Crew Info, select one or more events in the **Current Assignments** pane.
2. Drag the selected row(s) to the desired location in the list and release the mouse.



Unassigning a Crew

To drop an assignment from a crew, complete these steps:

1. In the Crew Info window, select the event from the **Current Assignments** table. The buttons at the bottom of the window become enabled.
2. Click the **Drop Assignment** button (). A dialog box opens asking if you are sure you want to remove the assignment.
3. Click **OK**.
    - The crew is unassigned from the event.
    - The event is removed from the list of crew assignments.
    - The crew button/crew row changes to white (if the crew is not en route/ onsite, unavailable, or assigned to another event).

Placing a Crew En Route to an Assigned Event

Placing a Crew En Route from the Crew Actions Window

To place a crew en route from the Crew Actions window using drag and drop, complete these steps:

1. Focus the Viewer on the event-related device you wish to place the crew en route to.
2. In the Crew Actions window, select an available, undispatched crew and drag it to the Viewer window toward the device associated with the event you wish to place the crew en route to.
3. Release the mouse button when the device becomes selected (highlighted) in the Viewer.
    - If multiple events are on the device, a dialog box prompts you to specify which event the crew should be placed en route to. Select the appropriate event.
    - The crew symbol appears at the device. The Crew Actions and Work Agenda windows update to indicate that the crew is now en route to the event.

Placing a Crew En Route from the Viewer

To place a crew en route from the Viewer using drag and drop, complete these steps:

1. Focus the Viewer such that you can see both the symbol of the crew you wish to re-dispatch and the event you wish to re-dispatch the crew to. Alternatively, you can open two Viewers and focus one Viewer on the crew's current location, and the other Viewer on the new location.
2. In the Viewer window, click and drag the crew symbol to the device that has the event you wish to place the crew en route to.
3. Release the mouse button when the device becomes selected (highlighted) in the Viewer.
    - If multiple events are on the device, a dialog box prompts you to specify which event the crew should be placed en route to. Select the appropriate event.
    - The crew symbol appears at the device. The crew is released from its previous event and placed en route to the new event. The Crew Actions and Work Agenda windows update to indicate that the crew is now en route to the new event and no crew is en route to the old event.

Placing a Crew En Route from Crew Info

If a crew has been assigned to an event, you can place the crew en route to the event using Crew Info.

To place the crew en route to the assigned event, complete these steps:

1. In Crew Info, select the event from the Current Assignments table. The toolbar buttons become enabled.
2. Click the **Place En Route** button ( ) and the crew is placed en route to the event.

You can place a crew en route to a device in the Viewer either by dragging a crew icon from the Crew Actions window to the affected device in the Viewer or by dragging a crew symbol on another device already in a Viewer to the affected device.

> Note: You can cancel the in-progress dispatch or crew move by pressing the **Esc** key or by dragging the crew outside the Viewer and releasing the mouse button.

Updating Active Job Event Information

To update event information, complete these steps:

1. To update the estimated restore date and time, enter the time it will take to restore the event and click the **Update Time** button. The **Est Restore Date** and time will change accordingly. You can also directly edit the estimated restore date and time field.
2. You can add event notes in the **Operations Event Notes** field.
3. Click **Apply** and your changes are saved.

Moving a Crew

Moving a crew does not change the event the crew is en route to, rather, it moves the crew to another device location and keeps it associated with the same event. By default, Oracle Utilities Network Management System locates a crew at the predicted or confirmed clearing device so that graphically the crew appears to be at the same location as the outage symbol in the Viewer. In some cases, the crew may actually have to work at a location different from the clearing device.

> **Note:** You are not required to move the crew to the actual device location, but moving the crew can help you better keep track of what is going on in the field.

Moving a Crew from the Crew Actions Window

To move a crew from the Crew Actions window using drag and drop, complete these steps:

1. Focus the Viewer on the device you wish to relocate the crew to.
2. In the Crew Actions window, click the en route crew and drag it to the Viewer window toward the device that has the event you wish to relocate the crew to.
3. Release the mouse button when the relocation device is selected (highlighted) in the Viewer. A confirmation dialog box appears.
4. Click **OK** to complete the move or **Cancel** to cancel the move.

Moving a Crew from the Viewer

To move a crew in the Viewer using drag and drop, complete these steps:

1. Focus the Viewer such that you can see both the symbol of the crew you wish to relocate and the device you wish to relocate the crew to. Alternatively, you can open two Viewers, and focus one Viewer on the crew's current location and the other on the new location.

2. In the Viewer window, click and drag the crew symbol to device that you wish to relocate the crew to.
3. Release the mouse button when the relocation device is selected (highlighted) in the Viewer. A confirmation dialog box appears.
4. Click **OK** to complete the move or **Cancel** to cancel the move.

Moving a Crew from Crew Info

To move a crew, complete these steps:

1. In the Active Jobs pane, click the **Move Crew…** button. The **Choose Work Location** dialog box opens.
2. Select the new device location in the Viewer window or select an event in the Work Agenda list that has the same device as the one where the crew is currently working.
3. Click **OK**. The crew symbol moves on the Viewer map and the crew's Device updates in the Crew Info and Crew Actions windows. The crew remains en route to/ onsite at that same event.

Releasing Crews from an Event

You may release crews from an en route/onsite event using the Work Agenda, the Crew Actions Crew Info window, or from event or crew symbology in the Viewer.

Releasing a Crew from the Active Jobs Pane

1. From the Active Jobs table of the Crew Info window select the crew you want to release.
2. Click the Release Crew button. The following occurs:
    - The crew is released from the event.
    - The crew's active job information is removed from the Crew Info window.
    - The crew button/row changes to white (if the crew is not assigned to another event).

Releasing Crews from an Event Selected in the Work Agenda

1. Select a row in the Work Agenda with en route or onsite crews.
2. Select **Release Crews...** from the **Actions** menu. The Release Crews dialog box opens listing the crews assigned to the event. One or more crews may be selected.
3. Click a crew name to select one crew. To select additional crews:
    - Click, hold, and drag to select multiple adjacent crews.
    - Control-click to select multiple non-adjacent crews.
4. With the crews selected, click **Release** to release the crews from the event. The Release Crew dialog box will close, the crew will no longer be associated with the event and the crew symbology will disappear from the Viewer.

Releasing a Crew from the Crew Symbol in the Viewer

1. Right-click the crew symbol in the Viewer.

2. Select Release Crew to release the crew from the event.

Releasing Crews from an Event Symbol in the Viewer

1. Right-click the event symbol.
2. Select **Release Crews...** from the option menu. The Release Crews dialog box opens listing the crews assigned to the event. One or more crews may be selected.
3. With the crews selected, click **Release** to release the crews from the event.

The Release Crews dialog box will close, the crew will no longer be associated with the event, and the crew symbology will disappear from the Viewer.

Suspending a Crew

You can suspend a crew that is currently en route to or onsite at an event. Suspending the crew indicates that the crew is not able to complete the work at this time and is expected to resume work on the assignment at a later time.

To suspend a crew from an en route/onsite event, complete these steps:

1. From the Active Jobs table of Crew Info window select the crew you want to suspend.
2. Click the Suspend check box. The suspend date and time defaults to the current date and time. To specify a different date and time, click the calendar icon and then select the date and time the crew was suspended. And then click on the Apply button. The following occurs:
    - The crew button in the Icons view and the crew row in the List view change to the Suspended color (orange, by default).
    - The Current Assignments table in the Crew Info window displays Yes in the Suspended column for this assignment.

Bulk Crew Loading and Deleting (Administrative Users)

Administrative Users may perform a bulk import or deletion of crews and crew components (members and vehicles) using the **nms-load-crews** program. The program, which is run from a terminal, requires separate CSV files for crews, crew members, and vehicles.

```
nms-load-crews -crews filename
                  -members filename
                  -vehicles filename
                  [-add|-delete]
                  [-force]
                  [-status inactive|off-shift|on-shift]
```

[] optional parameter

Options

crews: Required. The crew file to import.

members: Required. The members file to import.

vehicles: Required. The vehicles file to import.

add|**delete**: Whether to add or delete the crews, members, and vehicles. The default is **add**, which is assumed if omitted.

status: Used with the **-add** option. Whether to add new crews as inactive, off-shift, or on-shift. Default: off-shift.

force: Used with the **-delete** option. Whether to force the deletion of active crews. Default: false.

Example

```
nms-load-crews -crews crews.csv -members members.csv -vehicles
vehicles.csv
```

Crew CSV Columns

The columns in the Crew CSV file matches the CREWS database table column names:

CREW_KEY: numerical key for the crew

CREW_TYPE: CREW_TYPES.CREW_TYPE value

TEMP_FLAG: temporary crew Y/N flag

ZONE_NAME: CONTROL_ZONES.NAME value

ZONE_CLS: CONTROL_ZONES.NCG_CLASS value

ZONE_IDX: CONTROL_ZONES.NCG_ID value

CREW_SIZE: the crew size

CONTACT: the contact name

CREW_NAME: the crew name

MOBILE_NUM: the mobile number

MOBILE_CARRIER: the mobile carrier

ALTERNATE_NUM: the alternate contact number

ALTERNATE_NUM_TYPE: the alternate contact number type

PAGER_NUM: the pager number

MDT_CREW: MDT crew Y/N flag

EXTERNAL_KEY: external ID of the crew

OUT_OF_RANGE: out of range Y/N flag

MOBILE_FLAG: Y, N, or O (mobile overridden for NMS)

MEMBERS: colon-separated list of MEMBER_EMP_NUMB

VEHICLES: colon-separated list of VEHICLE_NUMB

Crew Member CSV Columns

The columns in the Crew Members CSV file matches the CREW_MEMBERS database table column names:

MEMBER_NAME: member name

MEMBER_CLASS: CREW_MEMBER_CLASSES.MEMBER_CLASS

MEMBER_EMP_NUMB: employee ID

Crew Vehicles CSV Columns

The columns in the Crew Vehicles CSV file matches the CREW_VEHICLES database table column names:

VEHICLE_TYPE: CREW_VEHICLE_TYPES.VEHICLE_TYPE

VEHICLE_NUMB: vehicle ID

Using Bulk Add/Delete Scripts

For convenience, two scripts (**nms-add-crews** and **nms-delete-crews**) are available to run the bulk crew changes. Pass arguments to these scripts as stated above or create your own project version that uses a consistent set of options that follow your project's business practices.

Examples

```
nms-add-crews -crews crews.csv -members members.csv -vehicles
vehicles.csv

nms-delete-crews -crews crews.csv -members members.csv -vehicles
vehicles.csv

nms-delete-crews -crews crews.csv -members members.csv -vehicles
vehicles.csv -force
```

Chapter 5

Web Call Entry

This chapter describes the Oracle Utilities Network Management System Web Call Entry application. Web Call Entry is used to enter and access customer call and event information. The application streamlines data entry and allows access to customer call, event, and dispatch information by personnel in various operations settings. Web Call Entry shares a database with other Oracle Utilities Network Management System applications. This allows you to view certain data that operations personnel and crew supervisors have entered into the system. The event history and call history information for a customer is often helpful when you are handling a new call from a customer reporting a service outage.

This chapter includes the following topics:

- Using Web Call Entry
- Searching for a Customer
- Viewing Call History
- Viewing Event History
- Entering a Customer Call
- Entering a Fuzzy Call
- Canceling a Customer Call
- Viewing the Outages Summary

Using Web Call Entry

Web Call Entry is presented as a single window that is divided into sections based on functionality and type of information displayed. The sections provide functional groupings of features, such as search-ability and data display.

Menus and Toolbars

The Web Call Entry menus and toolbars provide access to commonly used functions. Most of the functions in the **Actions** menu are also available on the toolbar.

File Menu

Menu Option	Description	Toolbar Icon
Outages Summary...	Opens the Outages Summary window.	

Actions Menu

Menu Option	Description	Toolbar Icon
Customer Search	Searches for customers based on the search criteria entered into the Searchable Information section. The system displays up to the first 100 customers located in the database that match the criteria.	
Intersection Search	Searches for a street intersection based on one or two street names entered into the Intersection Search section. The order of the street names does not matter for matching purposes.	
Call Search	Searches through previous calls based on the search criteria entered into the Searchable Information section. The system displays up to the first 100 calls located in the database that match the criteria.	
Submit Call	Saves the call details entered into the request sections and clears the form.	
Check Meter	Requests current status of the meter for the customer. This option is disabled if the customer is not AMR-enabled.	
Call History...	Opens **Call History**, which lists current and historical calls from the customer. This option is disabled if a previous call does not exist.	
Event History...	Opens **Event History**, which lists current and historical events involving the customer. Note that the customer need not have called to be part of an event. This option is disabled if a previous event does not exist.	
Clear Form	Removes customer, event, and crew information from the fields on the window. Remember to save the call, if desired, before clearing the fields.	

Options Menu

Menu Option	Description	Toolbar Icon
Set Wild Card Searching	Allows you to set the wild card search option. Wild card searching allows you to enter partial names or numbers in the searchable fields and all matching results will be returned. For example, if you have the wild card searching set to Both, and you enter "anders" into the Name field, the system returns customers named "Anderson", "Andersen", and "Sanders". • **Before** - puts a wild card before the search string • **After** - puts a wild card following the search string • **Both** - puts a wild card both before and after the search string	--
Use Sound Search	Allows you to use the "sounds like" search feature, which displays search results that are phonetically similar to the search criteria. For example, if you enter "Jon Doh", the system would return customers such as "John Doe." If you select this search option, Wild Card searching and Exact Match searching options are disabled until this option is toggled off.	--
Use Exact Match Search	Displays search results that exactly match the search criteria. This is the most restrictive search option. Wild Card searching and Sound searching options are disabled until this option is toggled off.	--
Set Max Searching Results	Allows you to set the maximum number of search results returned. If you enter a maximum search result of "50", up to 50 entries display in the Customer Selection or Call Selection (search results) dialog box. This feature is helpful when using wild card searching. (For performance reasons, the system will not allow the maximum search results to be set above 100.)	--

User Menu

The **User Menu** provides submenus with options to change the appearance and functionality of user interface elements and log out of Web Call Entry.

User Interface Settings Menu

Menu Option	Description
Theme Selection Radio Buttons • **Dark Theme** • **Light Theme**	Theme selection allows you to choose whether the Web Call Entry uses a **Dark Theme** or a **Light Theme**. • The **Dark Theme** is generally better for low-lit conditions. • The **Light Theme** is generally better for well-lit conditions.
Capitalize Field Labels	If selected, field labels will be displayed in All Caps (for example, **NAME**). If not selected, field labels will be displayed in title case (for example, **Name**).
Toggle Accessible Mode	Changes settings to enable use with screen readers. Note: There are prerequisites to enabling accessible mode. Please see Appendix A-Accessibility Features for information on enabling **Accessible** mode.
Show Messages at Mouse Location	Sets the system to display popup confirmation and warning dialog boxes at your mouse pointer position.
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Darken Watermarks	Make the watermarks more opaque.
Lighten Watermarks	Make the watermarks more transparent.
Show Watermarks	Allows you to toggle watermarks on or off.

Table Settings Menu

The Table Settings submenu allows you to configure how tables will appear.

Menu Option	Description
Alternate Row Coloring	When selected, displays data table rows in alternating colors.
Capitalize Column Headings	Allows you to select whether column labels should be displayed in all capital letters (for example, **STATUS**) or in title case (for example, **Status**)
Table Color Formatting Mode	Determines whether and how tables will display background coloring. **Options** • **None:** Tables will not contain color indicators for statuses. • **Cells:** Table cells will contain background colors based on the cell statuses. • **Row:** All cells in a table row will have the background color.
Table Font Formatting Mode	Determines whether and how tables will display font formatting. **Options** • **None:** Conditional formatting related to font formatting are never shown. • **Cells:** Conditional formatting related to font formatting are applied only to the cells they were configured for. • **Row:** Conditional formatting related to font formatting are applied across the whole row. Where more than one formatting rule is applied, the highest priority rule is displayed.

Manage Preferences Menu

Menu Option	Description
Save Preferences	Saves your preferences to the database so your settings are available wherever you log in. **Note:** Theme selection is saved to your user settings on the workstation since they are more likely influenced by the light in a location.
Restore Preferences	Opens a dialog box that allows you to select the preferences to restore.
Manage Site-wide Settings	**Options** • **Update Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the default preferences for all users of the log in type. • **Restore Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may restore the default preferences for the logged in user type to the original configuration.

User Logout: Logs you out of the system and shuts down the client.

Help Menu

Menu Option	Description
Web Call Entry Help	Launches the online help system and loads the Web Call Entry content.
Calculate Network Latency...	Runs a network diagnostic utility and returns the results in the **Network connectivity results** window.
Email Log Files...	Gathers the environment's log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Web Call Entry	Opens a window with environment and software information.

Field Descriptions

This section describes the fields and buttons on the Web Call Entry window.

Searchable Information

The Searchable Information section allows you to enter search criteria to locate information for the customer calling to report a problem or request service. You can execute a search with full or partial data by entering information in any of the searchable fields and then either clicking the **Search** button or selecting Search from the Actions menu. If there is more than one match for the query, results are displayed in a Customer Selection table. From the Customer Selection table, you can select the appropriate record. For more information, see Searching for a Customer.

The Searchable Information section displays the following fields:

- The **Call ID** field contains the unique Call ID generated when a call is entered. A successful search on this field will open the Call History window with information from this call.
- The **Account #** field contains the customer account number. Enter all or part of the account number to **search for the customer.**
- **The Telephone** field contains the customer telephone number. Enter all or part of the telephone number **to search for the customer.**
- **The Name** field contains the customer name. Enter all or part of the customer name to search for the customer.
- The **Address** field contains the customer address or the address for the problem location. Enter all or part of the address to search for the customer or problem location.
- The **City** field contains the city and state. Enter all or part of the city to search for the customer.
- The **Zip** field contains the zip code. Enter all or part of the zip code to search for the customer.

Intersection Search Section

The Intersection Search section allows you to enter one or two street names and see a list of all matching street intersections containing the names. This allows the entry of a call that can be associated to the street intersection, which is helpful if someone is reporting a traffic light that is out or an outage, but is not correctly located in the database.

The Intersection Search section displays the following fields:

- The **Street 1** field is required for searches and should just contain the street name with no numeric address part and no suffix such as St, Ln, Rd, S, W, and so on. Capitalization does not matter.
- The **Street 2** field is optional for searches and should just contain the street name with no numeric address part and no suffix such as St, Ln, Rd, S, W, and so on. Capitalization does not matter.

  Note: The order of the street names does not matter. If the database has "W 50th ST & BIRCH ST" as the intersection, it still will be found if you enter "Birch" for **Street 1**.

Additional Customer Information

The Additional Customer Information section displays the following fields:

- The **Account Type** field is a view-only field that indicates the type of customer account (for example, electric).
- The **Customer Type** field is a view-only field that indicates the type of customer (for example, critical). If a customer type has not been designated for the customer, this field will have 'STD'.
- The **Customer Device** field is a view-only field that indicates the device name associated with the customer.
- The **ERT to Report** field is used to track the estimated restore times (ERTs) given to a caller. If the customer is part of one or more outages, the **ERT to Report** field will default to the latest of the ERTs for outages affecting that customer. The button on the right opens a calendar dialog box from which the reported date and time can be selected.

When the **amr** product is licensed, the Additional Customer Information section contains several fields, which allow users to check the current customer's meter status.

- The **Meter** field is a view-only field that displays the meter identification.
- The **Request Meter Status** button allows the user to request the customer's current meter status. This button is disabled if the customer is not AMR-enabled.
- The **Meter Status** field is a view-only field that displays meter status information received from the AMI system or an indication that there is an outstanding meter status request for the customer.

Appointment Request

The Appointment Request section allows you to schedule an appointment or record a prior notification requirement for a meet. The Appointment Request section includes the following fields:

- **Type** is a drop-down list that allows you to select the appointment type:
  - **None**, the default value, signifies that there is not an appointment request for the call.
  - **After** signifies that an appointment is being scheduled within a range after the time given in the Date/Time field. For example, scheduling a meet between 8:00 a.m. and noon would have range of 04:00 and a time beginning at 08:00.
  - **Call Before** is for appointments where there is not a specific time or range, but the customer needs a certain amount of forewarning prior to the appointment. For example, it may be the time required for the customer travel from work to their home for the appointment.

Callback Request

The Callback Request section allows you to specify a callback mechanism and an optional callback number or email address, or indicate if no callback was requested. The information you enter in these fields is saved to the database and used by other Oracle Utilities Network Management System applications and possibly other third party systems that are interfaced to Oracle Utilities Network Management System.

The Callback Request section includes the following fields:

- **Callback Method:** Allows you to select how to notify a customer requesting a callback; the options are **Phone**, **Text**, or **Email**. The **Callback Phone|Text|Email** field allows you to enter the corresponding information.
- **ERT Updates:** Allows you to select whether to notify the customer of ERT updates.
- **Outage Restoration:** Allows you to select whether to notify the customer when the outage is restored.

Request

The Request section allows you to enter general details provided by the caller. The information you enter in these fields is saved to the database and used by other Oracle Utilities Network Management System applications and possibly other third party systems that are interfaced to Oracle Utilities Network Management System.

- **Power** is a drop-down list that allows you to select the status of the power (for example, **Dim Lights**).
- **Cause** is a drop-down list that allows you to select the cause (if known) of the event (for example, **Tree Limb on Wire**).
- **Description** is a drop-down list that allows you to select an additional description of the event (for example, **Sagging Wire**).
- **Street Light** is a drop-down list that allows you to indicate problems with streetlights or traffic lights.
- **Meter** is a drop-down list that allows you to select an action needed in regard to the meter (for example, Connect).
- **Meet** is a drop-down list that allows you to indicate whether emergency or other personnel should be met on the scene (for example, Meet Fire).
- **Priority** is a drop-down list that allows you to indicate whether the event is a priority situation (for example, extreme/life).
- **Other** is a drop-down list that allows you to cancel previous calls from this customer or enter in "informational" calls when the customer calls back to simply ask for more information about their event.

  Note: The actual set of drop-down lists may be different at your company.

Customer Comment

- The **Customer Comment** field allows you to enter a note based on the remarks of the caller.

Operations Event Note

- The **Operations Event Note** field displays any dispatcher or crew notes that may have been entered into the system, such as waiting for special equipment or for traffic police to secure an area. This field is view-only.

Event Information

The Event Information section is view-only and populated with information only if one or more active events are associated with the customer. The Event Information table displays information about each active event associated with the customer. To view the Operations Event Note if there are multiple events, select the desired event from the table.

The Event Information Section displays the following columns:

- The **Event #** column contains the unique number assigned to the event. The event number is also displayed in other Oracle Utilities Network Management System applications in order to track the status of the event.
- The **Event Device** column contains the name of the device associated with the event.
- The **Event Type** column contains a classification of the event. See **Event Type Codes** on page C-5 for a complete list of event type codes and their descriptions.
- The **Start Date** column contains the date and time the event began.
- The **Est Rest Time** column contains the date and time the operations center or the crew predicts the event will be resolved.
- The **Trouble Codes** column contains the trouble codes that were entered when the call was taken (for example, Sagging Wire). See **Event Type Codes** on page C-5 for a complete list of event type codes and their descriptions.
- The **Primary Cause** column contains the Primary Cause selected for the event in Event Details. See the Event Details **Using the Completion Actions Tab** on page 3-7 for information on Primary Cause selection.
- The **# Cust** column contains the estimated number of customers affected by the event.

Crew Information

The Crew Information section displays the following information about any crew currently associated with active events.

- The **Event #** column contains the unique number assigned to the event. The event number is also displayed in other Oracle Utilities Network Management System applications in order to track the status of the event.
- The **Crew ID** column contains the identification name or number of the crew.
- The **Assigned Date** column contains the date and time the crew was assigned to the event.If the crew is released or changed to en route, the column will be blank.
- The **# Assignments** column contains the total number of events to which the crew is assigned.
- The **En Route Date** column contains the date and time the crew was placed en route to the event.
- The **On Site Date** column contains the date and time the crew arrived on site.

Planned Outages Information

The Planned Outages Information section displays the following information about any upcoming planned outage that the customer will be a part of.

- The **Planned Start** column contains the date and time the planned switching work is scheduled to begin.
- The **Planned Finish** column contains the date and time the planned switching work is scheduled to end.
- The **Office** column contains the office responsible for the switching plan.
- The **Work Location** column contains the street address or specific location for the switching operation.
- The **Description of Work** column contains a general description about what the planned switching work is trying to accomplish.

Searching for a Customer

When a customer calls in, you can enter the details for the call in Web Call Entry. First you must search for the customer in order to populate the necessary information for submitting the call.

To search for a customer, complete these steps:

1. Verify that you have selected the preferred search option settings. Select the **Options** menu to view the current settings.
2. Enter all or part of the customer's information in the **Searchable Information** fields (for example, name, telephone number, and so on). Typically you will fill in search information in only one of the fields for a search.
3. Click the **Search** button on the toolbar, or press **Enter**. If a match is found, the customer information is displayed on the Web Call Entry window.
4. If more than one customer matches the search criteria, the Customer Selection dialog box displays the search results display in a table that contains the customer's account number, name, address, city, state, zip code, and telephone number. You can use this information to confirm that you are entering an event for the correct customer.
5. Select the customer from the list and click the **OK** button. The customer's information displays on the main Web Call Entry window.

Searching for a Customer Using the Call ID

When a customer calls in to follow up on a previous call, you can search for that call in Web Call Entry.

To search for a call using the original call ID, complete these steps:

1. Enter the call ID in the Searchable Information **Call ID** field.
2. Click the **Search** button on the toolbar, or press Enter. If a match is found, the Call History window opens. (See **Viewing Call History** on page 5-13.) Skip to step 5.
3. If more than one call matches your search criteria, the Call Selection dialog box opens. The search results display in a table that contains the call date/time, name, address, city, state, zip code, and telephone number. You can use this information to confirm that you are retrieving the correct call.
4. Select a call from the list and click the **OK** button. The call's information displays on the main Web Call Entry window.
5. Confirm that it is the correct call and click the **Load** button. The Call History window closes and the call information displays in the Web Call Entry window.

Search for a Call using Caller Information

To search for a call using previous caller information, complete these steps:

1. Verify that you have selected the preferred search option settings. Select the **Options** menu to view the current settings.
2. Enter all or part of the caller's information in the **Searchable Information** fields (for example, name, telephone number, and so on) Typically you will fill in search information in only one of the fields for a search.
3. Click the **Call Search** button on the toolbar. If a match is found, the call information is displayed.
4. If more than one call matches the search criteria, the Call Selection dialog box opens (see above). The search results display in a table that contains the call date/time, name, address, city, state, zip code, and telephone number. You can use this information to confirm that you are retrieving the correct call.
5. Select a call and click the **OK** button. The call information displays in the Web Call Entry window.

Viewing Call History

Call History allows you to view a historical record of customer calls. This is important for managing the relationship with customers who are repeat callers. Once you have selected a call from the customer's call history, you can view the details for the call.

Call History offers a tabular summary of each call a customer has made that is still in the database. The calls are chronologically ordered by call date, but can be sorted by any of the other columns by clicking on the column header. Click the column header once to sort in one direction (for example, ascending order), and click a second time to sort in the other direction (for example, descending order).

You can access **Call History** by clicking the **Call History** button on the toolbar or selecting **Call History...** from the Actions menu.

> **Note:** Your system administrator sets up the amount of call history data maintained in the database.

Call History User Interface

Call History displays the following sections.

Call History

- The **Call Date** column contains the date and time the customer call was entered.
- The **Trouble Codes** column contains the trouble conditions for the event (for example, out).
- The **Customer Comment** column contains comments from the customer as entered by the call taker, if any.
- The **Active** column is an indicator of whether the call is active. Values are:
  - Y - Yes, call (and associated event) are still active
  - N - No, call (and associated event) are resolved
  - C - Canceled, customer called back to cancel call
  - E - Canceled, operator canceled event via Work Agenda
- The **Reported ERT** column contains the ERT value that was explicitly provided to the customer on that call.
- The **Call ID** column contains the unique ID generated when call is entered into system.

If you select a row in the table, the details for that call are displayed in the window below the table. The call details include customer information, callback request information, event information (for example, cause), and customer comments. The information on the Call History window is view-only except for the Callback Phone and the Customer Comment area. The fields on the Call Details window generally match the fields on the main Web Call Entry window.

Call Taker ID

- The **Call Taker ID** field displays the ID of the user who recorded the call.

Control Zone

- The **Control Zone** field displays the Control Zone where the problem is located.

Call Information

- The **Reported Start Date** field is a field that indicates when the event was first reported to have started.

Customer Information

- The **Call ID** field contains the unique Call ID generated when a call is entered.
- The **Account #** field contains the customer account number.
- The **Telephone** field contains the customer telephone number.
- The **Name field** contains the customer name.
- The **Address** field contains the customer address or the address for the problem location.
- The **City** field contains the city, state, and zip code.

- The **Customer Type** field is a field that indicates the type of customer (for example, critical). If a customer type has not been designated for the customer, this field will have a value of zero (0).
- The **Customer Device** field is a field that indicates the device name associated with the customer.

Appointment Request

The Appointment Request section includes the following fields:

- **Type** is a drop-down list that allows you to select the appointment type:
  - **None**, the default value, signifies that there is not an appointment request for the call.
  - **After** signifies that an appointment is being scheduled within a range after the time given in the Date/Time field. For example, scheduling a meet between 8:00 a.m. and noon would have range of 04:00 and a time beginning at 08:00.
  - **Call Before** is for appointments where there is not a specific time or range, but the customer needs a certain amount of forewarning prior to the appointment. For example, it may be the time required for the customer travel from work to their home for the appointment.

Callback Request

- **Call Before Date** is a radio button that indicates that the customer wanted to be contacted (called back) when the event is restored.
- **No Callback Requested** is a radio button that indicates that the customer did not want to be called back regarding the event.
- The **Callback Phone** field contains an optional phone number that was entered if the customer wished to be called back at a different number than the primary phone number on their account.

Last Callback

- This displays the last **Callback Time** and **Callback Result**.

Request

- **Power** is a drop-down list that indicates the status of the power (for example, dim lights).
- **Cause** is a drop-down list that indicates the cause (if known) of the event (for example, tree limb on wire).
- **Description** is a drop-down list that indicates an additional description of the event (for example, sagging wire).
- **Street Light** is a drop-down list that indicates problems with streetlights or traffic lights.
- **Meter** is a drop-down list that indicates an action needed in regard to the meter (for example, connect).
- **Meet** is a drop-down list that indicates whether emergency or other personnel were to be met on the scene (for example, meet fire).
- **Priority** is a drop-down list that indicates whether the event is/was a priority situation (for example, extreme/life).

- **Other** is a drop-down list that indicates whether or not the call was simply an "informational" one (the call to cancel a previous call doesn't show up in the Call History, so this would never display the value of "Cancel").

Customer Comment

- The **Customer Comment** field displays the remarks of the caller, if any.

Toolbar Buttons

- The **Load** button loads Customer Information (based on the call) in the Web Call Entry window and closes the Call History window. Other information, such as Events and Crews, will be populated as if you had searched for the customer in the Web Call Entry window.

  Note: The **Load** button is only enabled if the search was based on Call ID.

- The **Save** button saves any changes to the Callback Phone or Customer Comment fields and closes the Call History window.
- The **Cancel** button allows you to cancel the selected call.
- The **Close** button closes the Call History dialog box.
- The **Help** button displays help for this window.

Viewing Event History

Event History offers a table summary of events related to the customer. The events are chronologically ordered by start date, but can be sorted by any of the other columns by clicking on the column header. You can access **Event History** by clicking the **Event History** button on the toolbar or selecting **Event History...** from the Actions menu.

> **Note:** Your system administrator sets up the amount of event history data available.

Event History Section

- The **Event #** column contains the unique number assigned to the event. The event number is also displayed in other Oracle Utilities Network Management System applications in order to track the status of the event.
- The **Customer Start Date** column contains the date and time the event was reported to have begun for this customer.
- The **Customer Restored Date** column contains the date and time the event was resolved for this customer. If this field is empty, then the event has not been completed in Oracle Utilities Network Management System.
- The **Event Type** column indicates whether the event was an outage or non-outage.
  - **OUT:** An outage event where some customers were without service.
  - **NON:** A non-outage event, such as street light always on/off.)
- If you select a row in the table, the details for that event are displayed in the window below the table. The event details include the event number, device and feeder information, and event time information. The information on the Event History window is view-only. Many of the fields on the Event History window match the Event Information and other fields on the main Web Call Entry window.

Event Information Section

- The **Event #** field displays the unique number assigned to the event. The event number is also displayed in other Oracle Utilities Network Management System applications in order to track the status of the event.
- The **Feeder** field displays the feeder associated with the event.
- The **Event Device** field displays the device associated with the event.
- The **Est Cust Affected** field displays the estimated number of customers affected by the event.
- The **Customer Start Date** field displays the date and time the event was reported to have begun for this customer.
- The **Customer Restored Date** field displays the date and time the event was resolved for this customer. If this field is empty, then the event has not been completed in Oracle Utilities Network Management System.
- The **Primary Cause** field displays the Event Details Primary Cause, if available. See the Event Details **Using the Completion Actions Tab** on page 3-7 for information on Primary Cause selection.

- The **Remedy** field displays the value from the Event Details Remedy drop-down list if it has been populated from Web Trouble.

Cause Factors

- The **Scheduled** field displays the value from the Event Details Scheduled drop-down list if it has been populated from Web Trouble.
- The **Utility Error** field displays the value from the Event Details Utility Error drop-down list if it has been populated from Web Trouble.
- The **Other** field displays the value from the Event Details Other drop-down list if it has been populated from Web Trouble.
- The **Foreign Interf.** field indicates any foreign interference associated with the outage.
- The **Vegetation** field displays the value from the Event Details Vegetation drop-down list if it has been populated from Web Trouble.
- The **Defective Equip.** field displays the value from the Event Details Defective Equip. drop-down list if it has been populated from Web Trouble.
- The **Environment** field displays the value from the Event Details Environment drop-down list if it has been populated from Web Trouble.
- The **Weather** field displays the value from the Event Details Weather drop-down list if it has been populated from Web Trouble.

Operations Cancellation Reason

- The **Operations Cancellation Reason** field displays the reason given for canceling the event if canceled by operations personnel. Typically done if event was inadvertently entered in the system.

Operations Event Note

- The **Operations Event Note** field displays notes entered regarding the event. These notes may include crew remarks and resolution issues.

Toolbar Buttons

- The **Close** button closes the Event History window.
- The **Help** button displays help for this window.

Entering a Customer Call

After you have located the information for a customer and have reviewed any call history and event history, you can proceed to enter a call. You enter all call information in the main Web Call Entry window.

To enter a customer call, complete these steps:

1. Search for the customer information. (For details on how to search for customer information, see Searching for a Customer.)
2. If the customer wishes to be called back when the event is complete, click the C**all Before Date** radio button. If part of your business process, and if the customer indicates a restriction, click on the **Calendar** button (at right) to enter the date and time after which the customer no longer wants to be called. If the customer provides a different phone number for the callback, enter it in the Callback Phone field.
3. Select the appropriate options from the drop-down lists in the Request section. These are necessary for operations personnel to understand and quickly resolve the event.
4. In the Customer Comments field, enter any information that the customer provides that will assist the operations personnel or the crew.
5. Save the call by clicking the **Submit Call** button on the toolbar or selecting the Submit Call option from the **Actions** menu. A dialog box will open displaying a Call ID.
6. Provide the Call ID to the customer, and then click the **OK** button to dismiss the dialog box.

Entering an Informational Call

A customer may call back to ask when their power is expected to be restored. If you need to keep track of when estimated restore times (ERTs) are provided to a customer, complete these steps:

1. Search for the customer information. (For details on how to search for customer information, see **Searching for a Customer** on page 5-12.)

   Note: The **ERT to Report** field will default to the latest of the ERTs for outages affecting that customer. If the field is blank, or if a different ERT is given to the customer (for example, by rounding the listed ERT up to the next half hour), then modify the field to display the actual ERT that the customer is told. Select the button on the right to open a calendar dialog box from which the reported date and time can be selected.
2. In the Web Workspace Request section, select the **Informational** option from the **Other** drop-down list.
3. Save the call by clicking the **Submit Call** button on the toolbar or selecting the Submit Call option from the Actions menu.

Entering a Fuzzy Call

Fuzzy calls are calls that are not initially associated with a customer or device. For example, a fuzzy call results when you receive a call from the police reporting that a pole is down at a street intersection. The fuzzy call can later be associated with a specific device.

The search will not match a specific customer, but will instead display the Fuzzy Call dialog box.

To enter a fuzzy call, complete these steps:

1. Enter the address information (for example, cross streets). A fuzzy call should have some address information filled in, even if it is just an intersection.
2. Click the **Search** toolbar icon or select the **Search** option from the **Actions** menu. A dialog box appears, indicating that there was no match for the search criteria, but the call can be edited or saved.
3. If you know the control zone associated with the trouble location indicated by the caller, click on the **Control Zone Selection** button to the right of the Control Zone field. Select the control zone from the tree display and then click the **OK** button.
4. Click the **Edit Call** button.
5. If the caller wishes to be called back when the event is resolved, click the **Call Before Date** radio button. Then, click on the **Calendar** button (at right) to enter the date and time after which the customer no longer wants to be called. Enter the caller's phone number in the **Callback Phone** field.
6. Select the appropriate options from the drop-down lists in the **Request** section, such as Power, Cause, Description, Street Light, Meter, Meet, Priority, and Other. (See Callback Request for details.) These are necessary for operations personnel to understand and quickly resolve the event.
7. In the **Customer Comments** field, enter any information that the caller provides that will assist the operations personnel or the crew.
8. Save the call by clicking the **Submit Call** button on the toolbar or selecting the **Submit Call** option from the **Actions** menu.

   Note: This button is only enabled if the Address field was filled in when the search was done.

   A dialog box will open displaying the Call ID.
9. Provide the Call ID to the caller, and then click the **OK** button to close the dialog box.

Canceling a Customer Call

You can cancel a call from the Call History window. This is useful if a customer calls back to indicate that the problem related to the initial call has been resolved. You can cancel fuzzy calls using this procedure.

> **Note**: The original call is not removed from the system; rather, its status is changed to C (canceled) and a new call is created with a status of N, indicating that the original call and its associated event have been resolved.

To cancel a customer call, complete these steps:

1. Search for the customer information. (For details on how to search for customer information, see Searching for a Customer.).
2. Click the **Call History** button on the toolbar or select **Call History...** from the Actions menu.
3. Select the call in the Call History list. The Cancel button is enabled.
4. Click the **Cancel** button on the toolbar. The Cancel Call dialog box is displayed.
5. Enter the reason for the cancellation, and click **OK**.
6. You can view the original canceled call and the new call entry in the Call History.

Canceling All Calls For a Customer Account

Use this procedure to cancel all calls for a customer account.

1. Search for the customer information. (For details on how to search for customer information, see **Searching for a Customer** on page 5-12.)
1. In the Request section of the main Web Call Entry window, select the Cancel option from the Other drop-down list.
1. Save the call by clicking the **Submit Call** button on the toolbar or selecting the Submit Call option from the Actions menu.

> **Note**: Fuzzy calls must be canceled in the Work Agenda. See the previous procedure.

Viewing the Outages Summary

The **Outages Summary** presents the user with a view-only summary of the total active outage events in the system. The information in the window dynamically updates as new calls come in and as new outages are created and restored. The events are sorted by default on the E/H and # Out values, but can be sorted by any of the other columns by clicking on the column header. You can access the Outages Summary by clicking the **Outages Summary** button on the toolbar or selecting **Outages Summary** from the **File** menu.

> **Note:** the Outages Summary is not available when Web Call Entry is integrated in the Web Workspace since the information is available in the Work Agenda.

The **Outages Summary** contains two tables. The top table is a summary and the table below it displays a row for each event in the summary table.

The summary table at the top of the Outages Summary window displays the following columns:

- The **Events in View** field displays the number of events currently displayed in the Outages Summary.
- The **Est Cust Out** field displays the number of customers estimated to be affected by the events currently displayed in the Outages Summary.
- The **Calls** field displays the number of calls entered for the events currently displayed in the Outages Summary.
- The **Pri Calls** field displays the number of priority calls entered for the events currently displayed in the Outages Summary.
- The **EMR Cust Out** field displays the number of emergency customers affected by the events currently displayed in the Outages Summary.
- The **MED Cust Out** field displays the number of medical customers affected by the events currently displayed in the Outages Summary.
- The **KEY Cust Out** field displays the number of key customers affected by the events currently displayed in the Outages Summary.
- The **Crews En Route/Onsite** field displays the number of crews en route to/ onsite at the events currently displayed in the Outages Summary.

The **Current Outages** table displays the following columns:

- The **E/H** column indicates whether or not the event is an emergency or hazardous condition. An "E" in this column denotes extreme emergency, and an "H" in this column denotes hazardous.
- The **# Out** column contains the number of customers experiencing an outage for the event.
- The **# Crit** column contains the total number of critical customers experiencing an outage for the event.
- The **# Calls** column contains the number of calls received for the event.
- The **Region** column contains the control zone region where the event occurred.
- The **Branch** column contains the control zone branch where the event occurred.

- The **Substation** column contains the control zone substation where the event occurred.
- The **Location** column contains either the address of the first customer that called if the event is a service outage or non-outage or the feeder location of the device if the event is a device outage.
- The **Start Date** column contains the date and time the event began.
- The **Est Restore Date** column contains the estimated restoration time (ERT) for the event.
- The **Est Src** column contains the source of the ERT for the event. The possible source values are:
  - N - none (no ERT)
  - S - Oracle Utilities Network Management System - Storm Management
  - P - Oracle Utilities Network Management System Storm Management "non-published global ERT"
  - O - Oracle Utilities Network Management System Storm Management "onsite ERT" used when the crew is en route or onsite. If the crew is en route, the ERT includes the travel time plus the repair time; if the crew is onsite, the ERT only includes the repair time.
  - G - Oracle Utilities Network Management System Storm Management "published global ERT"
  - C - User-entered (assumed to have been provided by the crew)
  - I - Initial default ERT
- The **Clues** column contains the clue codes for the calls received, if any.
- The **Status** column displays the status assigned to the event. See **Event Status Codes** on page C-1 for a complete list of status codes and descriptions.
- The **Crews** column contains the crew ids of the associated crews.

The **Operations Event Note** field displays the Operations Event Note for the selected event, if any.

Buttons

- The **Auto Filter** button allows you to quickly filter the view by the selected cell value.
- The **Auto Filter Off** button turns off any auto filter that has been applied.

Menus

The following table describes the Outages Summary menus.

Menu	Option	Description
File	Print	Opens up the Print Preview dialog box, which allows you to print out the Outages Summary window.
File	Exit	Closes the Outages Summary window.
Filter	Auto Filter	Allows you to quickly filter the view by the selected cell value.

Menu	Option	Description
Filter	Auto Filter Off	Turns off any auto filter that has been applied.
Actions	Default Sort	Applies the default sort to the Outages Summary.
Help	Web Call Entry Help	Opens online help for Web Call Entry.
Help	About Web Call Entry	Opens the standard About dialog.

Chapter 6

Web Callbacks

This chapter describes the Web Callbacks module functionality. It includes the following topics:

- Overview
- The Web Callbacks Window
- Assigning Callbacks
- Viewing Callback Assignments
- Unassigning Callbacks
- Performing Callbacks

Overview

Oracle Utilities Network Management System Web Callbacks is an application used to manage callback requests for customers who have called in reporting an outage. When the outage is resolved, Web Callbacks provides the information necessary to call customers. Web Callbacks allows you to assign groups of callbacks to users and outsourcing agencies, and also supports a "one-at-a-time" approach, where you can select an outage and perform the next callback. Callbacks are only created for customers who called in and had "Callback Requested" indicated when their call was entered.

Web Callbacks displays information about the outage and the original customer call, and allows you to save the results of the callback (outage restored, phone busy, power still out, and so on). Customers whose outage is not restored are re-introduced into the Oracle Utilities Network Management System for re-analysis and restoration. A Still Out trouble code clue, which appears in Clues field in Work Agenda and Trouble Info, is added to calls re-introduced in this way. Web Callbacks interfaces with other Oracle Utilities Network Management System modules to display customer comments and operations remarks.

The Web Callbacks Window

The Web Callbacks main window displays all of the events that have callbacks that must be completed. You can perform callback actions in the window using the menu, the buttons on the toolbar, or the buttons at the bottom of the window.

This following topics describe how to use the Web Callbacks window:

- Menus and Toolbars
- Header
- Callbacks Table
- Callbacks Summary Pane

Related Topics:

- Assigning Callbacks
- Viewing Callback Assignments
- Unassigning Callbacks
- Performing Callbacks

Menus and Toolbars

The Web Callbacks menu bar provides access to all functions. The commonly used functions are also available on the toolbar and in buttons at the bottom of the window.

Actions Menu

The **Actions** menu allows you to control certain common features of the Web Callbacks.

Menu Option	Description	
View My Callback Lists…	Opens the View My Callback Lists window, which displays a list of callbacks assigned to you.	
Perform Next Callback…	Opens the Perform Next Callback window, which allows you to perform the next callback for the selected event.	
Assign Callbacks…	Opens the Assign Callbacks window, which allows you to assign callbacks for the selected event.	

User Menu

The **User Menu** provides submenus with options to change the appearance and functionality of user interface elements and log out of Web Callbacks.

User Interface Settings Menu

Menu Option	Description
Theme Selection Radio Buttons • **Dark Theme** • **Light Theme**	Theme selection allows you to choose whether the Web Callbacks uses a **Dark Theme** or a **Light Theme**. • The **Dark Theme** is generally better for low-lit conditions. • The **Light Theme** is generally better for well-lit conditions.
Capitalize Field Labels	If selected, field labels will be displayed in All Caps (for example, **NAME**). If not selected, field labels will be displayed in title case (for example, **Name**).
Toggle Accessible Mode	Changes settings to enable use with screen readers. **Note:** There are prerequisites to enabling accessible mode. Please see Appendix A-Accessibility Features for information on enabling **Accessible** mode.
Show Messages at Mouse Location	Sets the system to display popup confirmation and warning dialog boxes at your mouse pointer position.
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Darken Watermarks	Make the watermarks more opaque.
Lighten Watermarks	Make the watermarks more transparent.
Show Watermarks	Allows you to toggle watermarks on or off.

Table Settings Menu

The Table Settings submenu allows you to configure how tables will appear.

Menu Option	Description
Alternate Row Coloring	When selected, displays data table rows in alternating colors.
Capitalize Column Headings	Allows you to select whether column labels should be displayed in all capital letters (for example, **STATUS**) or in title case (for example, **Status**)
Table Color Formatting Mode	Determines whether and how tables will display background coloring. **Options** • **None:** Tables will not contain color indicators for statuses. • **Cells:** Table cells will contain background colors based on the cell statuses. • **Row:** All cells in a table row will have the background color.
Table Font Formatting Mode	Determines whether and how tables will display font formatting. **Options** • **None:** Conditional formatting related to font formatting are never shown. • **Cells:** Conditional formatting related to font formatting are applied only to the cells they were configured for. • **Row:** Conditional formatting related to font formatting are applied across the whole row. Where more than one formatting rule is applied, the highest priority rule is displayed.

Manage Preferences Menu

Menu Option	Description
Save Preferences	Saves your preferences to the database so your settings are available wherever you log in. See **Saving and Restoring Workspace Preferences** on page 2-14 for more information. **Note:** Theme selection is saved to your user settings on the workstation since they are more likely influenced by the light in a location. See **Understanding the User Interface Settings Menu** on page 2-8 for information.
Restore Preferences	Opens a dialog box that allows you to select the preferences to restore. See **Saving and Restoring Workspace Preferences** on page 2-14.
Manage Site-wide Settings	**Options** • **Update Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the default preferences for all users of the log in type. • **Restore Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may restore the default preferences for the logged in user type to the original configuration. See **Saving and Restoring Workspace Preferences** on page 2-14 for more information.

User Logout: Logs you out of the system and shuts down the client.

Help Menu

Menu Option	Description
Web Callbacks Help	Launches the online help system and loads the Web Callbacks content.
Email Log Files...	Gathers the environment?'s log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Web Callbacks	Opens a window with environment and software information.

Header

Beneath the Web Callbacks Toolbar is the header section. This section contains information regarding who is logged in to the application.

- The **User Name** field displays your Web Callbacks login user name. This field is not editable.

Callbacks Table

The Web Callbacks table contains a detailed list of each resolved event that still has callbacks remaining. These rows are color-coded by the status of the callback (not started versus in progress).

The Callbacks Table displays the following columns:

- The **Event #** column contains the unique number of the event.
- The **# Callbacks** column contains the number of callbacks for the event.
- The **# Pri** column contains the number of callbacks from priority calls for the event.
- The **% Comp** column contains the percentage of callbacks completed for the event.
- The **# Rem** column contains the number of callbacks remaining for the event.
- The **# Asn** column contains the number of remaining callbacks for the event that have been assigned.
- The **Start Date** column contains the reported start date and time of the event.
- The **Restore Date** column contains the date and time the event was restored.
- The **Device** column contains the name of the device associated with the event.
- The **Status** column contains the status of callbacks for the event:
  - **In Progress** - Some callbacks for the event have been completed.
  - **Not Started** - Some callbacks for the event may have been assigned, but no callbacks are completed.
- The **Substation** column contains the name of the substation for the device associated with the event.
- The **Zone** column contains the name of the branch office where the event occurred.
- The **# Users** column contains the number of users with assigned callbacks for the event.

Callbacks Table Column Features

Web Callbacks allows you to sort columns of its table by clicking on the particular column. The column displays an ascending sort after the first click and a descending sort after the second. A black arrow displays the direction of the sort. Clicking on other

columns will initially sort based on the opposite sort type from the last column (ascending if previous column was sorted descending) and the sort direction reverses with subsequent clicks.

Sorting Callbacks

To sort based on a callback list column, complete these steps:

1. Click on the column that you want to sort. The column sorts in ascending order, indicated by a black arrow pointing upward.
2. Click again to sort the column in descending order, indicated by a black arrow pointing downward.
3. Click on a different column and the list is sorted ascending based on that column.

Rearranging Columns

You can dynamically rearrange the columns in a Web Callbacks list by dragging and releasing the column headers. To rearrange the columns, complete these steps:

1. On the column header for the column you want to move, click and hold down the mouse button with the pointer.
2. Move the pointer to drag the column left or right to the new location.
3. Release the mouse button. The column appears in the new location.

Note that this change is temporary. The next time you start Web Callbacks, the columns will display in their default order.

Callbacks Summary Pane

The Callbacks Summary pane appears in the lower portion of the Web Callbacks window. This pane displays summary information from the callback list. The Callbacks Summary pane includes the following fields:

- The **# Callbacks** field displays the total number of callbacks from events that still have active callbacks.
- The **% Complete** field displays the total percentage of callbacks listed in # Callbacks that are complete.
- The **# Remaining** field displays the total number of callbacks not completed, based on the # Callbacks.
- The **# Priority Calls** field displays the total number of callbacks that were priority, meaning those where the original call was for a priority situation (for example, hazardous downed wire).

  Note: Once all callbacks for an event have been completed, they are removed from the data displayed in the Callbacks Summary pane. As a result, the **% Complete** can actually decrease when the last callback for an event is completed and that event is removed from the calculation.Status Bar

The status bar appears at the bottom of the Web Callbacks window, providing informational messages to the user at various times. Messages will appear in the status bar when callbacks are assigned, unassigned, or canceled, when callbacks are saved or when a new callbacks user is created.

Assigning Callbacks

The Assign Callbacks window is used to assign callbacks for a specific event to you and/or other logged in users in order to manage the completion of the callback requests. If callbacks have been assigned to a user and that person is unable to complete the callbacks in a timely fashion, you can unassign those callbacks.

To access the Assign Callbacks window, select an event in the main Web Callbacks window, and then do one of the following:

- Select the **Assign Callbacks…** option from the **Actions** menu, or
- Click the **Assign Callbacks** button ( ) on the toolbar, or
- Click the **Assign Callbacks…** button beneath the Callbacks Summary pane.

This section includes the following topics:

- Using the Assign Callbacks Window
- Assigning Numbers of Callbacks
- Assigning Percentages of Callbacks
- Assigning All Remaining Callbacks
- Reassigning All Remaining Callbacks
- Unassigning Callbacks

Using the Assign Callbacks Window

The Event Info pane at the top of the Assign Callbacks window provides summary information about the event. The Event Callbacks pane provides a current status of callback assignments for the event per user, and allows you to change the number or percentage of assigned callbacks for each user.

> **Note:** When assigning callbacks to multiple users, you can assign a specific number of callbacks for the event to each user, or assign a percentage of the callbacks to each user.

The Assign Callbacks window displays the following fields and buttons:

- The **Event #** field displays the event number for which callbacks are being assigned.
- The **Device** field displays the name of the device associated with the event.
- The **Substation** field displays the name of the substation associated with the event.
- The **Total Callbacks** field displays the total number of callbacks for the event.
- The **% Complete** field displays the percentage of callbacks that are complete for the event.
- The **# Unassigned** field displays the number of callbacks for the event that have not been assigned.
- The **User Name** column contains the user name for each user currently logged in to the system. Other users appear in this column if they are permanently

available (for example, a third party agency or IVR system). You can assign callbacks to any user in this column.

- The **Include Priority Calls** column contains a check box that allows you to specify whether you want to include priority calls in the callback assignments for the user. This option is only available to users who have been designated as **Priority Users** (see **Adding a User** on page 24-5 for details).
- The **% Assigned** column contains the percentage of the total number of callbacks assigned to the user for the event. You can assign a specific percentage to the user by editing this field and then pressing the **Enter** key. If the percentage does not result in an exact number of callbacks (for example, the callback assignment would be 4.78), the system rounds to the nearest number (in this case, 5).
- The **# Asn** column contains the number of callbacks assigned to the user for the event. You can assign a specific number of callbacks to each user by editing this field and then pressing the **Enter** key.
- The **# Pri** column contains the number of callbacks for priority calls assigned to the user for the event. This column is not editable.
- The **# Rem** column contains the number of callbacks remaining assigned to the user for the event. This column is not editable.
- The **% Comp** column contains the percentage of the total number of callbacks assigned to the user for the event that are complete. This column is not editable.

Buttons

- The **Save** button saves any callback assignment changes and closes the Assign Callbacks window. There is also an option under the Assign Callbacks window's Actions menu for this action.
- The **Unassign** button unassigns the remaining uncompleted callbacks for the event for the selected user and closes the Assign Callbacks window. There is also an option under the Assign Callbacks window's Actions menu for this action.
- The **Assign Remaining** button assigns the remaining unassigned callbacks for the event to the selected user and closes the Assign Callbacks window. There is also an option under the Assign Callbacks window's Actions menu for this action.
- The **Exit** button closes the Assign Callbacks window without saving any changes. There is also an option under the Assign Callbacks window's File menu for this action.

Assigning Callbacks to Users

You can assign callbacks to yourself or to another user that is currently logged into the system, or to an external service if it has been set up in your system. All of the users that have access to the system can assign callbacks to themselves and to others.

Assigning Numbers of Callbacks

When assigning callbacks for an event, you can assign all callbacks to a single user or distribute the callbacks to multiple users. To assign a specific number of callbacks, follow these steps:

1. Select an event with multiple unassigned callbacks from the Web Callbacks main window.
2. Click the **Assign Callbacks** button ( ) on the toolbar.
3. Select the **# Asn** column for a user from the list of users.
4. Type the number of callbacks you want to assign to the user.
5. If the event has additional callbacks, select the column for another user and enter the number of callbacks that you want to assign to that user.
6. Once you have assigned all of the callbacks that you want to assign, click the **Save** button. The Assign Callbacks window closes.

Assigning Percentages of Callbacks

When assigning callbacks for an event, you can assign all callbacks to a single user, or distribute the callbacks to multiple users by percentage. To assign a percentage of callbacks for an event to a user, complete these steps:

1. Select an event with multiple unassigned callbacks from the Web Callbacks main window.
2. Click the **Assign Callbacks** button ( ) on the toolbar. The Assign Callbacks window opens.
3. Select the **% Assigned** column for a user.
4. Type "50" and press **Enter**. This will assign 50% of the callbacks to the selected user.
5. Click the **Save** button. The Assign Callbacks window closes.

Assigning All Remaining Callbacks

To assign all remaining callbacks for an event to a single user, complete these steps:

1. Select an event with multiple unassigned callbacks from the Web Callbacks main window.
2. Click the **Assign Callbacks** button ( ) on the toolbar. The Assign Callbacks window opens.
3. Select the **User Name** column for a user.

4. Click the **Assign Remaining** button. All remaining unassigned callbacks are assigned to the selected user. The Assign Callbacks window closes.

Reassigning All Remaining Callbacks

To reassign all remaining event callbacks for a user to another user, complete these steps:

1. Select the event with assigned callbacks for a user from the Web Callbacks main window.
2. Click the **Assign Callbacks** button ( ) on the toolbar. The Assign Callbacks window opens.
3. Select the **User Name** column for the user with uncompleted assigned callbacks.
4. Click the **Unassign** button. All remaining assigned callbacks for the selected user are now unassigned. The Assign Callbacks window closes.
5. Reopen the Assign Callbacks window using one of the methods above.
6. Select the **User Name** column for the user you wish to perform the remaining callbacks.
7. Click the **Assign Remaining** button. All remaining unassigned callbacks are assigned to the selected user. The Assign Callbacks window closes.

Viewing Callback Assignments

With the View My Callback Lists window, you can view all of the callbacks currently assigned to you. To access the View My Callback Lists window, do any of the following:

- Select the **View My Callback Lists…** option from the **Actions** menu, or
- Click the **View My Callback Lists** button ( ) on the toolbar, or
- Click the **View My Callbacks Lists…** button beneath the Callbacks Summary pane.

This section includes the following topics:

- View My Callback Lists Window
- Viewing Your Callback Assignments
- Canceling Your Callback Assignments

View My Callback Lists Window

The View My Callback Lists window displays the following fields and buttons:

- The **User Name** field displays the user name that you are logged in as.
- The **# of Callback Lists** Assigned field displays the total number of events for which you have callback assignments.
- The **Event #** column contains the event number associated with the callback list.

- The **# Callbacks** column contains the number of callbacks assigned to you for the event.
- The **# Pri** column contains the number of priority calls among your assigned callbacks for the event.
- The **% Comp** column contains the percentage of your assigned callbacks that are complete.
- The **# Rem** column contains the number of callbacks assigned to you for the event that need to be completed.
- The **Restore Date** column contains the date and time the event was restored.
- The **Device** column contains the name of the device associated with the event.
- The **Substation** column contains the name of the substation for the device associated with the event.

Buttons

- The **Unassign All** button unassigns all of your remaining callbacks for all lists. This might be done if you are taking a break and therefore need to make the callbacks available for others to do. There is also an option under the View My Callback Lists window's Actions menu for this action.
- The **Perform Callback List…** button opens the Perform Callback List window for the selected event, which allows you to enter the callback response for each callback assigned to you from that event. There is also an option under the View My Callback Lists window's Actions menu for this action.
- The **Cancel Callbacks** button allows you to cancel all of your remaining callbacks for the selected event and consider them complete.
- The **Exit** button closes the View My Callback Lists window.

Viewing Your Callback Assignments

To view callbacks assigned to you, complete these steps:

1. **View My Callback Lists** button ( ) on the toolbar. The View My Callback Lists window opens, displaying all events with callbacks assigned to you.
2. Click the **Exit** button to exit the View My Callbacks Lists window.

Canceling Your Callback Assignments

To cancel callbacks assigned to you for a specific event, complete these steps:

1. Click the **View My Callback Lists** button ( ) on the toolbar. The View My Callback Lists window opens, displaying all events with callbacks assigned to you.
2. Select the row of the event you wish to cancel your assigned callbacks for.
3. Click the **Cancel Callbacks** button. A confirmation dialog box appears.
4. Click the **Yes** button on the confirmation dialog box. Your assigned callbacks for that event are now considered complete. If there are no more uncompleted callbacks assigned to other users remaining for that event, that event row will disappear from

the window. Otherwise, that event row will remain displayed until all callbacks for that event are complete.

5. Click the **Exit** button to exit the View My Callbacks Lists window.

Unassigning Callbacks

You can unassign callbacks that have not been completed. You may unassign callbacks for a single event, or unassign all callbacks assigned to you.

> **Note:** If you exit Web Callbacks, the system automatically unassigns all of your remaining callbacks.

This section includes the following topics:

- Unassigning Callbacks for a Specific Event
- Unassigning All of Your Callbacks

Unassigning Callbacks for a Specific Event

To unassign callbacks for a specific event, complete these steps:

1. On the main Web Callbacks window, select the event for which you want to unassign callbacks.
2. Click the **Assign Callbacks** button ( ) on the toolbar. The Assign Callbacks window opens.
3. Select the **User Name** column for the user whose callbacks you wish to unassign.
4. Do one of the following:
   - To unassign all of the user's remaining callbacks for the event, click the **Unassign** button. The Assign Callbacks window closes.
   - To unassign a portion of the user's remaining callbacks for the event, enter a lower number of callbacks in the # Asn column for the user, or a lower percentage of callbacks in the % Assigned column, then press the **Enter** or **Tab** key. Click the **Save** button. The Assign Callbacks window closes.

Unassigning All of Your Callbacks

To unassign all of your callbacks, complete these steps:

1. Click the **View My Callback Lists** button ( ) on the toolbar. The View My Callback Lists window opens, displaying all events with callbacks assigned to you.
2. Click the **Unassign All** button. A confirmation dialog box appears.
3. Click **Yes** on the confirmation dialog box. The View My Callback Lists window closes.

Performing Callbacks

Once you have assigned callbacks to yourself, or another user has assigned callbacks to you, you can complete those callbacks using the Perform Callback List window. You may also perform callbacks that are unassigned (not currently assigned to any user) using the Perform Next Callback window.

The Perform Callback List window is used to record the results as you are completing your assigned callbacks for an event. The Event Information pane at the top of the window provides summary information about the event. The Event Callbacks Summary pane provides a status of your callback assignments for the event. The callback list table lists customers who have requested a callback for the event, and the Additional Customer Information pane provides more details regarding the customer selected in the callbacks list table.

This section includes the following topics:

- Accessing the Perform Callback List
- Using the Perform Next Callback Window
- Performing Assigned Callbacks for an Event
- Performing Unassigned Callbacks (Next Callback)

Accessing the Perform Callback List

To access the Perform Callback List window:

1. Click the **View My Callback Lists** button ( ) on the toolbar. The View My Callback Lists window opens, displaying all events with callbacks assigned to you.
2. Select a row for an event in the View My Callback Lists table and either:
   - Select the **Perform Callback List…** option from the Actions menu, or
   - Click the **Perform Callback List…** button.

   The Using the Perform Callbacks List Window opens.

Using the Perform Callbacks List Window

The Perform Callbacks List window displays the following information:

- The **Event #** field displays the event number for which callbacks are being performed.
- The **Substation** field displays the name of the substation associated with the event.
- The **Zone** field displays the name of the branch office associated with the event.
- The **Device** field displays the name of the device associated with the event.
- The **Start Date** field displays the date and time the event began.
- The **Restore Date** field displays the date and time the event was restored.
- The **Operations Event Note** field displays any comments entered for the event by operations staff.

- The **# Callbacks** field displays the total number of your assigned callbacks for the event.
- The **# Remaining** field displays the number of your callbacks remaining for the event.
- The **% Complete** field displays the percentage of your callbacks that are complete for the event.
- The **Account #** column contains the customer account number.
- The **Name** column contains the name of the customer to be called back.
- The **Telephone** column contains the telephone number on record for the customer.
- The **Callback Method** column contains the method to be used (Phone, Text, Email).
- The **Callback #** column contains the number or email address to use.
- The **Callback Type** column contains the type of callback to perform.
- The **Callback Status** column is a drop-down list that lets you select the result of the call to the customer. This is the only editable field on the form. See **Callback Status** on page D-5 for status colors and descriptions.
- The **Callback Date** column contains the date and time the callback was performed. This column is automatically populated when you change the Callback Status.
- The **Customer Type** column contains an indication of whether the customer is a critical customer (for example, medical or key account).
- The **Priority** check box indicates whether or not the callback is associated with a priority call.
- The **Device** field in the Additional Customer Information pane displays the name of the selected customer's service device.
- The **Address** field displays the selected customer's service address.
- The **City** field displays the selected customer's city.
- The **Clues** field displays the trouble code clues received for the customer's call.
- The **Customer Comment** field displays the customer comments entered when the customer called, if any.

Buttons

- The **Save** button saves all callback status changes since the last save. This can be done after each callback (recommended), after every several callbacks, or just before exiting. There is also an option under the Perform Callback List window's File menu for this action.
- The **Cancel Callbacks** button allows you to cancel all of your remaining callbacks for the selected event and consider them complete.
- The **Exit** button closes the Perform Callback List window, returning you to the View My Callback Lists window. There is also an option under the Perform Callback List window's File menu for this action.

Performing Assigned Callbacks for an Event

Once you have been assigned a number of callbacks, you can begin completing them. To perform a callback, complete these steps:

1. Click the **View My Callback Lists** button ( ) on the toolbar. The View My Callback Lists window opens, displaying all events with callbacks assigned to you.
2. Select a row for an event in the View My Callback Lists table and click the **Perform Callback List…** button.

   The Perform Callback List window opens displaying the details of the event and information for each customer to be called back.
3. Select a row for the callback you want to perform. At this time, you would physically make the call to the customer. Use the Callback Phone number if it exists. Otherwise use the number listed in the Telephone column.
4. Once the call is complete, change the Callback Status based on the result (for example, restored).
5. Click the **Save** button.
6. Make any remaining callbacks and change the Callback Status accordingly. Make sure that you click the **Save** button before exiting if you aren't saving after each call.
7. Click the **Exit** button when you have completed all of the callbacks.

Performing Unassigned Callbacks (Next Callback)

You can perform callbacks that are not assigned to any user using the Perform Next Callback window. This window allows you to select events from the main window and perform callbacks that have not yet been assigned to a user. The Perform Next Callback window displays the same information as the Perform Callback List window, just in a different order.

The callback that displays is automatically assigned to you so it cannot be assigned to anyone else. If you save a Callback Status of anything other than "Restored," "Not Restored," or "Cancel," the callback is not considered complete and remains assigned to you. If you do not save a Callback Status, the callback will be unassigned when you exit the Perform Next Callback window. You can also continue to process unassigned callbacks for this event by clicking the **Next Callback** button.

This section includes the following topics:

- Using the Perform Next Callback Window
- Performing the Next Unassigned Callback for an Event

Using the Perform Next Callback Window

To access the Perform Next Callback window, select an event in the main Web Callbacks window that has unassigned callbacks remaining, and then do one of the following:

- Click the **Perform Next Callback** button ( ) on the toolbar, or
- Select the **Perform Next Callback…** option from the Actions menu, or
- Click **Perform Next Callback…** button beneath the Callbacks Summary pane.

The Perform Next Callback Window displays the following fields and buttons:

- The **Event #** field displays the event number for which callbacks are being performed.
- The **Substation** field displays the name of the substation associated with the event.
- The **Zone** field displays the name of the branch office associated with the event.
- The **Device** field displays the name of the device associated with the event.
- The **Start Date** field displays the date and time the event began.
- The **Restore Date** field displays the date and time the event was restored.
- The **Operations Event Note** field displays any comments entered for the event by operations staff.
- The **# Callbacks** field displays the total number of callbacks for the event.
- The **# Remaining** field displays the number of callbacks remaining for the event.
- The **% Complete** field displays the percentage of callbacks that are complete for the event.
- The **Account #** field displays the selected customer's account number.
- The **Name** field displays the name of the customer to be called back.
- The **Address** field displays the selected customer's service address.
- The **City** field displays the selected customer's city.
- The **Customer Type** field displays an indication of whether the customer is a critical customer (for example, medical or key account).
- The **Device** field in the Customer Information pane displays the name of the selected customer's service device.
- The **Clues** field displays the trouble code clues received for the customer's call.
- The **Customer Comment** field displays the customer comments entered when the customer called, if any.
- The **Priority** check box indicates whether or not the callback is associated with a priority call.
- The **Telephone** field displays the telephone number on record for the customer.
- The **Callback Phone** field displays the alternate telephone number (for example, cell phone) for the customer, if provided during original call.
- The **Callback Status** column is a drop-down list that lets you select the result of the call to the customer. See **Callback Status** on page D-5 for status colors and descriptions.
- The **Callback Date** column contains the date and time the callback was performed. This column is automatically populated when you change the Callback Status.

Buttons

- The **Next Callback** button populates the Perform Next Callback window with the next unassigned callback for this event, if any, and assigns the callback to you.

There is also an option under the Perform Next Callback window's **Actions** menu for this action.

- The **Save** button saves the result for this callback and enables the Next Callback button. There is also an option under the Perform Next Callback window's **File** menu for this action.
- The **Exit** button closes the Perform Next Callback window. There is also an option under the Perform Next Callback window's File menu for this action.

Performing the Next Unassigned Callback for an Event

To perform the next unassigned callback for an event, complete these steps:

1. On the Web Callbacks main window, select an event that has unassigned callbacks remaining (# Asn column less than # Rem column).
2. Click the **Perform Next Callback** button ( ) on the toolbar. If all callbacks for the selected event have been assigned, an error dialog box displays.
3. Place the phone call to the customer, using the phone number listed in the Callback Phone field, if provided. Otherwise, use the number in the Telephone field.
4. When the call is complete, select the appropriate option from the Callback Status drop-down list.
5. Click the **Save** button.
6. If there are unassigned callbacks remaining for the event and you want to perform them, click the **Next Callback** button and repeat the three previous steps.
7. Click the **Exit** button to close the Perform Next Callback window.

Note: The callback accessed from the Perform Next Callback window is assigned to you when the window opens to prevent another user from being assigned to it as well. If you save a result for the callback that does not actually complete it (for example, Busy, No Answer) and then exit the Perform Next Callback window, it will remain assigned to you. If you exit the Perform Next Callback window without saving a result for the callback, the callback returns to being unassigned.

Chapter 7

Storm Management

This chapter describes the Oracle Utilities Network Management System Storm Management application. It includes the following topics:

- Getting Started with Storm Management
- Storm Management Full Operations Environment
- Storm Management Information Overview
- Storm Management View Only Environment
- Storm Management Storm Administration Environment

Getting Started with Storm Management

Storm Management enables you to manipulate the event and crew information that the system will use to make its calculations. This section describes the environment including menus, toolbar, status bar, and other common components of Storm Management.

> **Note:** Many utilities have different rules sets configured for storms versus normal conditions, which will affect the operation of Storm Management. Changing rule sets is done using the **Change Rule Set...** button on the **Web Workspace Authority** tool. For information on changing rule sets, see **Changing the Rule Set** on page 2-28.

Storm Management provides different functionality and views based on the user type that you log in as.

- **Full Operations:** provides Storm Management functionality for the operations user to edit storm, system, and crew criteria. See **Storm Management Full Operations Environment** on page 7-2 for details of the Full Operations environment
- **View Only:** displays the information available to the Full Operations environment in a read-only mode. See **Storm Management View Only Environment** on page 7-44 for details.
- **Storm Administration:** provides a post-storm data maintenance environment. See **Storm Management Storm Administration Environment** on page 7-46 for details.

Storm Management Full Operations Environment

This section describes the Storm Management window and general functionality. It includes the following topics:

- User Interface Features
  - Menus
  - Status Bar
  - Storm Management Information Panes

User Interface Features

Menus

There are four menus on the Storm Management menu bar:

- System Menu
- Storm Menu
- User Menu
- Help Menu

System Menu

The options in the System menu are available in both storm and non-storm modes. The following table describes the System Menu options and associated toolbar icons.

Menu Option	Description	Toolbar Icon
Toggle Storm Mode...	Used to transition a control zone between the Storm Management non-storm and storm modes of operation. Opens the Define Storm dialog box, prompting you to enter the information required to transition between modes. This option is not available in study mode.	
Save Changes	Saves any changes made in the window outside of the Crew Information table.	
ERT Override...	While periodically simulating the restoration process, Storm Management makes an estimated assessment and calculates an *Estimated Restoration Time* (ERT) for each eligible event. The estimates are accessible to other NMS modules. This option opens the **ERT Override** dialog box, which allows the accessibility of the Storm Management estimates to other modules to be turned on and off at any control zone level, and also allows for an alternate global or *tiered* estimate to be applied at any control zone level instead. The ERT Delays tab allows the user to adjust **calculated** ERT values, for any control zone, with a delay factor.	

Menu Option	Description	Toolbar Icon
Force Simulation Run	Immediately invokes the simulation of the entire restoration process, recalculating the estimates. This option is typically only used in study mode.	
Retrieve Update	Refreshes the window with the most recent information from the system. In most cases, the window refreshes itself on a periodic basis. But, if there are unsaved changes in the Storm Management window at the time the automatic refresh is due to occur, the window will not refresh. Instead, an alert appears in the status bar indicating that an update is available, and the Retrieve Update option must be invoked in order to refresh the window with the new update. This allows you to continue making your changes and save them first before refreshing.	
Print All…	Opens the Print Preview dialog box, which allows you to print the Summary Information pane, Storm Report pane, Storm Information pane (if present), Crew Information pane (if present), and status bar information from the current Storm Management window. See **Taking Authority for Control Zones** on page 2-24 for details on printing and using the Print Preview window.	
Print Crews…	Opens the Print Preview dialog box, which allows you to print out the Crew Information pane from the current Storm Management window. This option is only available in storm mode.	

Storm Menu

The options in the Storm menu are only enabled when Storm Management is in storm mode. The following table describes the Storm Menu and associated toolbar options.

Menu Option	Description	Toolbar Icon
Toggle Study Mode	Toggles the Storm Management window between real-time and study modes of operation. The current mode is displayed in the status bar.	
Export Study Session	When in study mode, allows you to export the current study session crews and parameters to the real-time session.	
Reset Study Session	When in study mode, allows you to reset the current study session with the current real-time session crews and parameters.	
Forecast Profiles…	Opens the Forecast Profiles dialog box, which is used to save and pre-load outage forecasting parameters. This option is only available in storm mode at the simulation level.	

Menu Option	Description	Toolbar Icon
Calculate Crews...	Opens the Calculate Crews dialog box, which is used to determine the approximate number of crews needed to complete assessment and repair by a specified date and time.	

User Menu

The **User Menu** provides submenus with options to change the appearance and functionality of user interface elements and log out of Storm Management.

User Interface Settings Menu

Menu Option	Description
Theme Selection Radio Buttons • **Dark Theme** • **Light Theme**	Theme selection allows you to choose whether the Web Call Entry uses a **Dark Theme** or a **Light Theme**. • The **Dark Theme** is generally better for low-lit conditions. • The **Light Theme** is generally better for well-lit conditions.
Capitalize Field Labels	If selected, field labels will be displayed in All Caps (for example, **NAME**). If not selected, field labels will be displayed in title case (for example, **Name**).
Toggle Accessible Mode	Changes settings to enable use with screen readers. Note: There are prerequisites to enabling accessible mode. Please see Appendix A-Accessibility Features for information on enabling **Accessible** mode.
Show Messages at Mouse Location	Sets the system to display popup confirmation and warning dialog boxes at your mouse pointer position.
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Darken Watermarks	Make the watermarks more opaque.
Lighten Watermarks	Make the watermarks more transparent.
Show Watermarks	Allows you to toggle watermarks on or off.

Table Settings Menu

The **Table Settings** submenu allows you to configure how tables will appear.

Menu Option	Description
Alternate Row Coloring	When selected, displays data table rows in alternating colors.
Capitalize Column Headings	Allows you to select whether column labels should be displayed in all capital letters (for example, **STATUS**) or in title case (for example, **Status**)
Table Color Formatting Mode	Determines whether and how tables will display background coloring. **Options** • **None:** Tables will not contain color indicators for statuses. • **Cells:** Table cells will contain background colors based on the cell statuses. • **Row:** All cells in a table row will have the background color.
Table Font Formatting Mode	Determines whether and how tables will display font formatting. **Options** • **None:** Conditional formatting related to font formatting are never shown. • **Cells:** Conditional formatting related to font formatting are applied only to the cells they were configured for. • **Row:** Conditional formatting related to font formatting are applied across the whole row. Where more than one formatting rule is applied, the highest priority rule is displayed.

Manage Preferences Menu

Menu Option	Description
Save Preferences	Saves your preferences to the database so your settings are available wherever you log in. **Note:** Theme selection is saved to your user settings on the workstation since they are more likely influenced by the light in a location.
Restore Preferences	Opens a dialog box that allows you to select the preferences to restore.
Manage Site-wide Settings	**Options** • **Update Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the default preferences for all users of the log in type. • **Restore Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may restore the default preferences for the logged in user type to the original configuration.

User Logout: Logs you out of the system and shuts down the client.

Help Menu

The options in the Help menu are available at all times. The following table describes the Help Menu options.

Option	Description
Storm Management Help	Opens the Online Help content for Storm Management.
Email Log Files...	Gathers the environment's log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Storm Management	Opens a dialog box that displays information regarding what version of the application is presently running, as well as version and other information about the Oracle Utilities Network Management System Web Gateway that the application is using.

Status Bar

The status bar appears at the bottom of the Storm Management window, providing operating details for the system. The status bar displays the following fields:

- The **Last Update** field displays a time stamp indicating the date and time at which the most recent estimates were calculated.
- The **Update** field is an indicator that changes from "No Update" to "Available Update" (with a highlighted background) when there are unsaved changes at the time the automatic refresh of the Storm Management window is due to occur. The refresh does not occur until you click the **Retrieve Update** button or select **Retrieve Update** from the **System** menu.
- The **Real-Time/Study** Mode field displays "Study Mode" when the currently selected control zone is in the Storm Management study mode of operation and "Real-Time Mode" with a highlighted background when the zone is in real-time mode.
- The **Storm/Non-Storm Mode** field displays "Non-Storm Mode" when the currently selected control zone is in the Storm Management non-storm mode of operation and "Storm Mode" (with a highlighted background) when the currently selected zone is in the Storm Management storm mode of operation.
- The **ERT Override** field indicates whether any control zone in the system presently has its Storm Management estimates accessible to other modules (for example, may be displayed in an Oracle Utilities Network Management System **Work Agenda** column and available in Oracle Utilities Network Management System **Web Call Entry**) or overridden by an alternate estimate. If they are not accessible, or if they are overridden, this field displays "ERT Override: On" with a highlighted background; if not, it will display "ERT Override: Off."
- The **ERT Delay** field indicates whether ERT delays are active. If there is an active ERT delay, the field displays "ERT Delay: On" (with a highlighted background); if not, it will display the "ERT Delay: Off."
- The **Lookups** field indicated the historical lookup values for Shift, Season, and Day Type.

Storm Management Information Panes

The Storm Management **Full Operations** environment is divided into labeled and bordered panes. A pane may be visible or hidden based on whether Storm Management is in Non-Storm or Storm Mode.

Pane Name	Description	Displayed in Modes
Zone Selection	The Zone Selection pane provides the Control Zone hierarchy in a tree view. An individual Control Zone may be selected for a given storm or to drill down to get information about that zone when the storm applies to a higher level zone. See **Zone Selection** on page 7-12 for details.	Non-Storm, Storm

Pane Name	Description	Displayed in Modes
Storm Information	The Storm Information pane displays data entered when defining the storm. See **Storm Information** on page 7-9 for details.	Storm
Summary Information	The Summary Information pane provides an overview of the estimates for both the selected zone and the Company level zone. See **Summary Information** on page 7-12 for details.	Non-Storm, Storm
Storm Report	The Storm Report pane provides an overview of the historical averages, actual averages, and estimates for each outage type in the currently selected control zone. See **Storm Report** on page 7-9 for details.	Non-Storm, Storm
Crew Information	The Crew Information pane lists crew information for the currently selected control zone and its children. Crews are grouped by skill/type and by control zone.	Storm

Storm Management Information Overview

This section describes the Storm Management operating modes and related information displays:

- Storm Management Modes
- Storm Information
- Summary Information
- Storm Report
- Zone Selection

Storm Management Modes

Storm Management has two major modes of operation: Non-storm and Storm.

Non-Storm Mode

Non-storm mode applies to everyday operations. When calculating estimates, crew resources are not taken into account because it is assumed there are enough crews available to handle all events. All control zone views operate in non-storm mode until explicitly placed into storm mode.

Storm Mode

Storm mode is useful during and after a storm or other high volume outage period. In Storm mode, the estimate calculations factor in crew availability.

Study Mode

Study mode, which is an option when in Storm Mode, enables you to manipulate parameters that affect the estimate calculations, such as outage forecasting, manual overrides, and crew information without altering the current real-time calculations. Also, once in study mode, the user can export parameters from the study session back into the real-time session. Study mode is only valid while the storm is active. If another user ends the storm while you are in study mode, you will see a message that the zone is no longer in storm mode.

Storm Information

The Storm Information pane displays information about a defined storm (see **Using Define Storm Dialog** on page 7-20).

The Storm Information pane displays the following fields:

- The **Storm Name** field displays the name of the storm. This field is not editable and is populated by information entered into the Storm Name field of the Define Storm dialog box.
- The **Storm Start** field displays the starting date of the storm. This field is not editable and is populated by information entered into the Start Date field of the Define Storm dialog box.
- **Storm Level** is a drop-down list of severity levels of the storm. It is initially populated by the option selected on the Storm Level drop-down list of the Define Storm dialog box. If you modify the Storm Level for a control zone that has child zones as part of the same storm, the Storm Level for all of those child zones will be changed to the modified value as well.
- **Special Condition** is a drop-down list of special storm types. It is initially populated by the option selected on the Special Condition drop-down list of the Define Storm dialog box. If you modify the Special Condition for a control zone that has child zones as part of the same storm, the Special Condition for all of those child zones will be changed to the modified value as well.

Storm Report

The Storm Report is the main Storm Management pane. It provides an overview of the historical averages, actual averages, and estimates for each outage type in the currently selected control zone. Each time you select a different control zone from the Zone Selection tree, the Storm Report pane refreshes to display the information for the newly selected zone.

The Storm Report pane displays the following columns:

- The **Outage Types** column contains the name of the Storm Management outage type category.
- The **Actual Outages** column contains the actual number of unrestored events of the corresponding outage type in the currently selected control zone.
- The **Total Outages** column contains the total number of forecasted outages of the corresponding outage type in the currently selected control zone. If the currently selected control zone is operating storm mode, this value may be assigned or calculated as a percentage of the Actual Outages column using the

Storm Management outage forecasting functionality. If the currently selected control zone is operating in non-storm mode, the value of this column is equal to the value of the Actual Outages column, because the outage forecasting functionality is not available in non-storm mode.

- The **Travel to Assess** column contains the average number of minutes between dispatch of an assessment crew and the arrival of that crew on the job site. The number outside of the parentheses is the historical average used in the Storm Management estimate calculations. The number in parentheses is the actual average that has been occurring in the field over the past 2 hours.
- The **Assess** column contains the average number of minutes taken to assess the effort needed to restore/repair the event. The number outside of the parentheses is the historical average used in the Storm Management estimate calculations. The number in parentheses is the actual average that has been occurring out in the field over the past 2 hours.
- The **Travel to Repair** column contains the average number of minutes between dispatch of the repair crew and the arrival of that crew on the job site. The number outside of the parentheses is the historical average used in the Storm Management estimate calculations. The number in parentheses is the actual average that has been occurring out in the field over the past 2 hours.
- The **Repair** column contains the average number of minutes taken to restore/ repair the event. The number outside of the parentheses is the historical average used in the Storm Management estimate calculations. The number in parentheses is the actual average that has been occurring out in the field over the past 2 hours.
- The **Clean** column contains the average number of minutes taken to by the repair crew to clean up after the event is restored before going to the next job. The number outside of the parentheses is the historical average used in the Storm Management estimate calculations. The number in parentheses is the actual average that has been occurring out in the field over the past 2 hours.
- The **Total Time to Assess hrs:min** column contains the raw amount of time required to assess all outages of the corresponding outage type in the currently selected control zone, in hours and minutes. The very basic formula for calculating this value is the following: (Travel to Assess + Assess) * number of Actual Outages. However, if any outage forecasting or manual overrides are currently applied, or if the simulation has any of the outages projected to be assessed at a time that would use a different Travel to Assess or Assess time other than what's currently displayed in the Storm Management window, then that basic formula no longer holds.
- The **Estimated Assessed By** column contains the estimated date and time at which the last of all outages with the corresponding outage type in the currently selected control zone will be assessed.
- The **Total Time to Restore hrs:min** column contains the raw amount of time required to repair all events of the corresponding outage type in the currently selected control zone, in hours and minutes. The very basic formula for calculating this value is the following: (Travel to Repair + Repair) * number of Actual Outages in non-storm mode, or (Travel to Repair + Repair + Clean) * number of Actual Outages in storm mode. However, if any outage forecasting or manual overrides are currently applied, or if the simulation has any of the outages projected to be repaired at a time that would use a different Travel to

Repair or Repair or Clean time other than what's currently displayed in the Storm Management window, then that basic formula no longer holds.

- The **Estimated Restored By** column contains the estimated date and time at which the last of all outages with the corresponding outage type in the currently selected control zone will be restored.
- The **Forecast Mode** drop-down list enables you to select what kind of outage forecasting you want to apply. This field is only enabled when the currently selected control zone is one at the simulation level operating under storm mode. List options include:
  - **% Change** - Allows the **% Change** cell, which is beneath the Actual Outages column, to become editable, enabling you enter a percentage greater than 100, but smaller than 32,768. This increases the value in the Total Outages column for each outage type by that percentage.
  - **Value** - Allows the Total Outages cell for each outage type row to become editable. It also disables the % Change cell under the Actual Outages column.

Summary Information

The Storm Management Summary Information pane provides an overview of the estimates for both the selected zone and the Company level zone. Each time you select a different control zone from the Zone Selection tree, the Summary Information pane refreshes to display the information for the newly selected zone. (If you select the Company level zone, the Summary Information table contains only the one row of Company information.)

The Summary Information pane displays the following fields:

- The **Zone** column contains the name of the Company level zone and the currently selected zone.
- The **Est Assessed By** column contains the estimated date and time when all assessment within the control zone will be complete.
- The **Est Restored By** column contains the estimated date and time when all events within the control zone will be restored.
- The **ERT Override** field displays the alternate estimated restoration time, if a published or non-published control-zone wide alternate estimate is currently being applied to the selected zone. See **ERT Override Dialog Box** on page 7-13 for more information.

Zone Selection

The Zone Selection pane is available in both Non-Storm and Storm modes. Storm Management information is displayed on a per control zone basis, supporting views for the top three levels of the control zone hierarchy in the operations model. The top-level (usually the "Company" level) control zone view displays when Storm Management starts up.

Selecting the Control Zone to View

You can view the information for another control zone by selecting that zone in the Zone Selection tree. The data displayed applies to the selected zone and all of its children. However, some components may be disabled if the currently selected control zone is not at the simulation level.

Using Storm Management

Storm Management supports two operational modes: Non-storm Mode and Storm Mode. Non-storm mode applies to everyday operations. When calculating estimates, crew resources are not taken into account because it is assumed there are enough crews available to handle all events. Storm mode is useful during and after a storm or other high volume outage periods. In this mode, the estimate calculations factor in crew availability. All control zone views operate in non-storm mode until explicitly placed into storm mode.

Using ERT Overrides

While it is periodically simulating the entire restoration process, Storm Management calculates an estimated assessment and restoration time for each eligible event. These estimates for each event are accessible to other modules (for example, may be displayed in a Work Agenda column). However, it is not always prudent to have these estimates available to the other modules; for example, when you initially enter storm mode and the available crew resources have not been fully defined, the calculated estimates would be rather inaccurate.

ERT Overrides provides the ability to override calculated ERTs for one or more specified control zones. The ERT overrides will impact existing outages as well as future outages in those control zones until the override is removed. Either a new specific ERT can be specified using the ERT Override tab, or an ERT offset from the outage start time can be specified using the ERT Delay tab. Both tabs also support tiering, which provides more granular override values based on the number of customers impacted by an event.

> **Note:** The ERT overrides will not affect the ERT of existing outages with an ERT source of 'C', meaning it was input by a crew or operator as opposed to calculated by the system.

ERT Override Dialog Box

To open the ERT Override dialog box, do one of the following:

- Select the **ERT Override...** option from the System menu, or
- Click the **ERT Override** button on the toolbar.

The ERT Override window opens with the ERT Override tab displayed. The ERT Delay functionality is accessed via the ERT Delay tab. Both window tabs offer consistent actions via the buttons at the bottom of the window.

ERT Override Tab Fields

- The **Zone** column contains the control zone that is having its Storm Management calculated estimates made inaccessible or overridden. With a row selected, click in the Zone field to activate the Control Zone Selection button (), which opens the Control Zone Selection dialog box. Select the desired Control Zone and click **OK**.
- The **Tier** column contains the optional tier criteria for using a given ERT Override value. See the **Add Tier** button description below to learn how to add tiers. Note that if tiers are used, the ERT Override field on the Summary Information pane will not display a value (since there will likely be more than one), but rather just display "Published" or "Non-Published."

- The **ERT Override** column contains the estimated restoration date and time for all events within the control zone to be displayed outside of Storm Management. Once you click in the ERT Override column, a date selector. The date/time you enter must be in the future. This field may be left blank.
- The **Publish Projections** column contains a check box that indicates whether or not the ERT Override value is published to other modules for the affected events.
- The **Override All Existing ERTs** check box indicates whether the ERT Override, as applied to the selected row (zone), will override all ERTs (of that zone) irrespective of the ERT source.
- The **User** column displays the id of the user who provided the ERT override/ delay value.

ERT Delay Tab

The ERT Delay tab exchanges the ERT Override column for a Delay column; all other columns function exactly the same as described in the ERT Override tab overview including the ability to add tiers to the delay.

- The **ERT Delay** column contains the delay to be added to the start time of outages to calculate the ERT, rather than using the normally calculated ERT. Once you click in the ERT Delay column, a mask for hours and minutes is displayed (that is, ##:##). Enter a delay value in hours and minutes to set the delay value. The ERT Delay will be activated once the OK button is clicked.

  Example - Using the Mask

  If you want to set the ERTs to be four hours and 30 minutes from the outage start times, enter 0430; the mask will show 04:30.

ERT Override Buttons

- The **Add** button adds a new row to the table in the ERT Override dialog box. That row may then be edited to contain the desired control zone, ERT Tier (using the **Add Tier** button), ERT Override date/time, and publish values. If a row marked for removal is selected, pressing the Add button will undo the removal mark. New, unsaved rows display in the table as green. Edited, unsaved rows display in the table as cyan.
- The **Add Tier** button adds a tier to a *selected* row. The Tier column will be populated with a context menu that defaults to the first tier criteria. Clicking the menu will display all of the tiers configured in the system. If multiple tiers are configured with overlapping numbers of customers impacted, the first tier (T1) values will take precedence over the second (T2) and third (T3) tiers; likewise, T2 will take precedence over T3.

The product configuration has three tiers each with five values:

- Tier 1
  - T1 1-5 customers
  - T1 6-25 customers
  - T1 26-100 customers
  - T1 101-250 customers
  - T1 >250 customers

    - Tier 2
        - T2 1-10 customers
        - T2 11-100 customers
        - T2 101-250 customers
        - T2 251-500 customers
        - T2 >500 customers
    - Tier 3
        - T3 1-50 customers
        - T3 51-250 customers
        - T3 251-500 customers
        - T3 501-750 customers
        - T3 >750 customers
- The **Remove** button highlights the selected row and it's child rows (zones) whose ERT value is empty (in red) to indicate that it has been marked for removal from the table in the ERT Override dialog box. Rows are not removed until you click the **OK** button.
- The **OK** button applies any actions taken, with the following exceptions:
    - If the ERT Override table contains more than one row for the same zone, an error dialog box will appear and no changes will be saved. I
    - If another user enters an ERT override while you have the dialog box open, the system will block the update and display an ERT override conflict message that tells you to refresh the data to see the latest values. Once the data has been refreshed, using the Refresh button, you may then modify the ERT override, if still applicable.
- The **Print…** button brings up the Print Preview dialog box, which allows you to print out the contents of the ERT Override dialog box.
- The **Cancel** button closes the dialog box without saving changes, and leaves the accessibility/overrides of the Storm Management estimates as they were.
- The **Refresh** button repopulates the ERT Override dialog box with the latest information from the server.

  Note: Applying overrides to the Storm Management estimates has no effect on events that have a crew onsite or events that have had an ERT manually entered in Oracle Utilities Network Management System. Those events will retain the display of their present manually entered/ Storm Management ERT.

The following table describes what occurs when different combinations of ERT Override column and Publish Projections column values are applied.

If...	Then...
The **Publish Projections** check box is checked and you enter a date and time in the ERT Override column for that row…	All events in that control zone will receive that date and time as their default ERT value outside of Storm Management: The ERT Override value displays in the ERT Override field of the Summary Information table along with the word "Published." The ERT Override value displays for current outages in that control zone in other modules. New outages in that control zone receive the ERT Override value until you turn the override of the Storm Management estimates off.
The **Publish Projections** check box is checked and you did not enter a date and time in the ERT Override column for that row…	• For top-level zones, publishing an empty ERT Override value is not supported. To hide ERT values, deselect the **Publish Projections** check box. • For child zones where the parent zone already has an override, then the blank value for the child zone indicates that it should be excluded from the parent override and normal ERT calculation is applied.
If the **Publish Projections** check box is not checked and a date and time are entered in the ERT Override column for that row…	All events in that control zone will receive a blank value as their default ERT value outside of Storm Management, regardless of whether or not a date and time is entered in the ERT Override column for that row; current and new events display a blank ERT value in other modules until you turn the override of the Storm Management estimates off. The ERT Override value displays in the ERT Override field of the Summary Information table along with the word "Non-Published."
If the **Publish Projections** check box is not checked and a date and time are not provided in the ERT Override column for that row…	All events in that control zone will receive a blank value as their default ERT value outside of Storm Management, regardless of whether or not a date and time is entered in the ERT Override column for that row; current and new events display a blank ERT value in other modules until you turn the override of the Storm Management estimates off. The ERT Override field in the Summary Information pane contains the word "Non-Published."

Note: If the **Override All Existing ERTs** check box is selected, then all of the above operations are applied to all incomplete events irrespective of the Est Src.

Turning Off Accessibility of the Estimates

To turn the accessibility of the estimates off, complete these steps:

1. Do one of the following:
    - Click the **ERT Override** button on the toolbar, or

- Select the ERT Override option from the System menu. The ERT Override dialog box opens.

2. Click the **Add** button to add a new row to the ERT Override table.
3. Click into the Zone cell of the new row, and then click the button on the right of the Zone field.
    - The Control Zone Selection dialog box opens.
4. Select the control zone whose estimates you wish to make inaccessible.
5. Click **OK**.
    - The Control Zone Selection dialog box closes.
    - The zone you selected populates the Zone field.
6. Uncheck the Publish Projections check box.
7. Click **OK**. Storm Management's calculated estimates for that control zone are no longer accessible to other Oracle Utilities Network Management System windows and the ERT Override dialog box closes.

Overriding the Estimates

To override the estimates to a default "global" ERT for the events in a zone, complete these steps:

1. Do one of the following:
    - Click the **ERT Override** button on the toolbar, or
    - Select the **ERT Override**... option from the System menu. The ERT Override dialog box opens.
2. Press the **Add** button to add a new row to the ERT Override table.
3. Click into the Zone cell of the new row, and then click the button on the right of the Zone field.
    - The Control Zone Selection dialog box opens.
4. Select the control zone whose estimates you wish to make inaccessible and click **OK**.
    - The Control Zone Selection dialog box closes.
    - The zone you selected populates the Zone field.
5. Select the ERT Override cell of the new row, and then click the date/time field.
6. Select a date and time for the new default ERT. Click **OK** on the Date/Time dialog box to close it.
7. Click out of the ERT Override cell and into a different cell to ensure the ERT Override time is saved.
8. Make sure the Publish Projections check box is checked.
9. Click **OK**. Storm Management's calculated estimates for that control zone are no longer displayed to other modules; the provided ERT Override value is displayed instead. The ERT Override dialog box closes.

Changing Publish/Non-Publish or Default ERT Information

If you have the accessibility of the Storm Management estimates turned off, you can revise the default ERT, or you can change from publishing the default ERT to not publishing it or vice versa, without having to first turn the accessibility back on. To do this, complete these steps:

1. Do one of the following:
    - Click the **ERT Override** button on the toolbar, or
    - Select **ERT Override.**.. option from the System menu. The ERT Override dialog box opens.
2. If you want to update the ERT Override for a zone, click into the ERT Override cell of the applicable row, click the Date/Time button.
3. Select a date and time, then click **OK**.
4. Click out of the ERT Override cell and into a different cell to ensure the ERT Override time is saved.
5. Check or uncheck the Publish Projections check box for the applicable row.
6. Click **OK**. The following occurs:
    - The ERT Override dialog box closes.
    - The default ERT is published and/or revised if the Publish Projections check box was checked, or
    - The default ERT is not published if the Publish Projections check box was not checked.

Turning Accessibility of Projections Back On/Removing Overrides

To turn the accessibility of the Storm Management estimates back on and/or remove ERT Overrides, complete these steps:

1. Do one of the following:
    - Click the **ERT Override** button on the toolbar, or
    - Select the **ERT Override**... option from the System menu. The ERT Override dialog box opens.
2. Select the row that corresponds to the zone for which you want to turn the accessibility of estimates back on/remove the applied ERT Override.
3. Press the **Esc** key.
4. Click **Remove**.
5. Repeat previous steps as needed.
6. Click **OK**. The following occurs:
    - All eligible events immediately receive the most recently calculated Storm Management estimates.
    - If all rows have been removed from the ERT Override table, the status bar indicates ERT Override is off.

Printing ERT Overrides

To print the contents of the ERT Override dialog box, complete these steps:

1. Do one of the following:
   - Click the **ERT Override** button on the toolbar, or
   - Select the **ERT Override...** option from the System menu. The ERT Override dialog box opens.
2. Click the **Print…** button. The Print Preview dialog box opens.
3. Adjust the scale, orientation, and page setup as desired.
4. Click the **Print** button on the toolbar to print the pages. The Print Preview dialog box disappears and the print output appears at your selected printer.

Manual Overrides

It actual averages may be significantly different from the historical averages. The Storm Report's **% Change** row lets you temporarily manually override each category of historical averages. The percentage you enter (within the allowed range of 1% to 32767%) changes the lookup values that are used in the calculation of the estimates. This functionality is only available when the currently selected control zone is at the simulation level.

Overriding Historical Averages

To override the historical averages, complete these steps:

1. Make sure the currently selected control zone is at the simulation level.
2. Click in the cell of the % Change row for the column of the corresponding historical average category you want to change.
3. Revise the percentage in the cell to the value you want to use.
4. Click **Enter**.
5. Click the **Save** button on the toolbar or select Save from the System menu. The historical averages in the column immediately update to reflect the change.

Storm Management will use the modified values when recalculating estimates during the next scheduled simulation iteration. The modified values stay in place until you manually change the % Change row back to 100% or, if applied during storm mode, you exit storm mode. The historical averages are not changed in the database.

Using Storm Mode

Storm mode is useful during and after a storm or other high volume outage period. In this mode, the estimate calculations factor in crew availability.

Once a crew arrives onsite at an event, the Storm Management estimate calculation will then use the actual crew arrival time rather than the projected arrival time. The estimate calculation can adjust again when a crew reports an estimated repair time based upon observed field conditions.

This section includes the following topics:

- Entering Storm Mode
- Using Define Storm Dialog
- Placing a Control Zone in Storm Mode and Defining the Storm Information
- Joining Existing Storms
- Joining a Control Zone to an Existing Storm
- Changing Storm Levels
- Changing Storm Types
- Forecasting Outages
- Using Forecast Profiles
- Working with Crew Information
- Using Study Mode
- Exiting Storm Mode

Entering Storm Mode

To enter storm mode for a control zone, complete these steps:

1. Do one of the following:
   - Select **Toggle Storm Mode** from the System menu, or
   - Click the **Toggle Storm Mode** button on the toolbar.

   The Define Storm dialog box opens. Enter the storm data.
2. Click the **Ok** button.

   Note: You can only enter storm mode from real-time mode. Once in storm mode, you can switch to study mode.

Using Define Storm Dialog

The Define Storm dialog box opens once you toggle to storm mode. You must enter information about the storm before Storm Management will change modes. The information you provide here is used to populate parts of the Storm Information section of the window.

The Define Storm dialog box displays the following fields and buttons:

- The **Zone** field displays the Name of the currently selected zone. This control zone and all of its children that aren't already in storm mode will be placed into storm mode as a part of this storm. This field is not editable.

- The **Storm Name** field allows you to enter the name of the storm. This value is used in conjunction with the current date as the unique identifier of the storm. If this field is not populated when you click the OK button, and error appears. Click OK to close the message and correct the error.
- **Special Condition** is a drop-down list of storm types that indicate a predefined condition existing with the storm. This condition may also dictate a different set of historical average values be used in the estimate calculations made by the system.
- **Storm Level** is a drop-down list of severity levels for the storm. This value is recorded for information and reporting purposes only and has no effect on the estimate calculations.
- **Start Date** is the date and time at which the storm started. When you deselect the **Use Current Time** option, the Date/Time field will become editable. Valid dates and times are those prior to (and including) the current time. If your entry is invalid, an error message appears. Click **OK** to close the message and correct the error.
- The **Use Current Time** check box is selected by default. This option allows you to leave the **Start Date** field blank and have the current system time on the server be used as the Start Date of the storm. Deselecting this option enables editing in the **Date/Time** field.
- The **OK** button saves the entered storm information and closes the dialog box. Storm Management is now operating in storm mode for the corresponding control zones.
- The **Help...** button launches online help for the Define Storm dialog box.
- The **Cancel** button discards the entered storm information and closes the dialog box without switching the currently selected control zone into storm mode.

Placing a Control Zone in Storm Mode and Defining the Storm Information

To place a control zone in storm mode and define the storm information, complete these steps:

1. Make sure the desired control zone is selected in the Zone Selection pane, and that the zone is in non-storm mode.
2. Do one of the following:
    - Select the Toggle Storm Mode option from the System menu, or
    - Click the **Toggle Storm Mode** button on the toolbar. The Define Storm dialog box opens.
3. Provide information in the Storm Name field.
4. Select a Special Condition from the drop-down list, if desired.
5. Select a Storm Level from the drop-down list, if desired.
6. Select a date and time for the storm's Start Date. Either:
    - Leave the **Use Current Time** option checked.
    - Uncheck the **Use Current Time** option. Edit the date and time in the Date/Time field. Click **OK**.

7. In the Define Storm dialog box, click **Ok**. The following occurs:
    - The Storm Information pane appears in between the Zone Selection and Summary Information panes. The Crew Information pane appears below the Zone Selection and Storm Report panes.
    - Storm Management operates in storm mode for the selected control zone.
    - If the selected control zone has any child zones not already operating in storm mode, the child zones operate in storm mode as part of this same storm.

    Note: If your system has a control zone set up directly beneath the top-level control zone to contain all of the fuzzy events in the system, that fuzzy control zone cannot be placed into storm mode. That fuzzy zone will only go into storm mode when its parent zone is placed into storm mode.

Joining Existing Storms

If you try to place a control zone into storm mode and either: 1) there are other control zones at the same level that are already operating in storm mode, or 2) the selected zone has children that are currently operating in storm mode, then the Define Storm dialog box opens with a Join Existing Storm pane. This pane gives you the option of adding the currently selected control zone to an existing storm rather than creating a separate new one.

The Join Existing Storm pane lists the existing storms that the selected control zone can be added to. When you select a storm from the list, the Storm Details section of the dialog box populates with the information that pertains to the selected storm, and then the only editable field is the Start Date.

The Join Existing Storm pane displays the following buttons:

- The **Clear Selection** button deselects the storm in the list and reverts the fields of the Storm Details section back to their default, editable values. This button is only enabled when an existing storm is selected from the list.
- The **Ok** button saves the entered storm information and closes the dialog box. Storm Management is now operating in storm mode for the corresponding control zones.
- The **Cancel** button discards the entered storm information and closes the dialog box without switching the currently selected control zone into storm mode.

Joining a Control Zone to an Existing Storm

To join a control zone to an existing storm, complete these steps:

1. Make sure the desired control zone is selected in the Zone Selection tree, and that the zone is in non-storm mode.
2. Do one of the following:
    - Select the Toggle Storm Mode option from the System menu, or
    - Click the **Toggle Storm Mode** button on the toolbar. The Define Storm dialog box opens with the Join Existing Storm pane displayed.
3. In the Join Existing Storm pane, select the storm you want the selected zone to join.

4. Select a date and time for the storm's start date using one of the methods below:
    - Leave the Use Current Time option checked. The current system time on the server will be used as the Start Date of the storm in this control zone.
    - Uncheck the Use Current Time option. The Start Date of the storm you selected to join will be used as the Start Date of the storm in this control zone, unless you explicitly edit it.
    - To then edit the Start Date, select the Start Date field and select a date and time for the storm's start date. Click **OK**. The selected date and time populate the Start Date field.
5. In the Define Storm dialog box, click **Ok**. The following occurs:
    - The Storm Information pane appears in between the Zone Selection and Summary Information panes. The Crew Information pane appears below the Zone Selection and Storm Report panes.
    - Storm Management operates in storm mode for the selected control zone.
    - If the selected control zone has any child zones not already operating in storm mode, the child zones operate in storm mode as part of this same storm.

    Note: If all of the children of a zone are eventually placed under the same storm individually with the Join Existing Storm pane, the parent zone is automatically placed into storm mode when the last child zone is joined to that storm. The parent zone adopts the earliest Start Date of all of its children.

Changing Storm Levels

The Storm Level value is recorded for information and reporting purposes only and has no effect on the estimate calculations.

To change the Storm Level selection, complete these steps:

1. Make sure the currently selected control zone is at the simulation level and operating in storm mode.
2. In the Storm Information pane, select the new storm type from the Storm Level drop-down list.
3. Click the **Save Changes** button or select the Save Changes option from the System menu.
    - Any child zones of the currently selected zone that are also part of this same storm will receive the new storm level as well.

Changing Storm Types

The storm type listed in the Special Condition drop-down list is linked to a specific set of historical average values. If the characteristics of a zone's storm change, you can change the Special Condition value and have the system use a new set of historical average values in its estimate calculations for that zone.

To change the Special Condition storm type, complete these steps:

1. Make sure the currently selected control zone is at the simulation level and operating in storm mode.

2. In the Storm Information pane, select the new storm type from the Special Condition drop-down list.
3. Click the **Save Changes** button or select **Save Changes** from the System menu.
    - The Storm Report pane immediately repopulates with the historical averages for the new storm type.
    - Any child zones of the currently selected zone that are also part of this same storm will receive the new storm type as well.
    - Storm Management will use the historical average values that apply to the new storm type when recalculating estimates for events in that control zone, as well as its child zones that belong to the same storm, during the next scheduled simulation iteration.

Example of Changing Storm Types

For example, the Branch level of the control zone hierarchy is the simulation level. A Wind/Rain storm was defined for the Stark branch zones, which includes the Lake, Alliance, and Massillon zones. However, the temperature in the Alliance zone was cold enough for ice to form. The Special Condition in the Stark zone is set to Wind/Rain storm, so estimates being calculated for Alliance could be inaccurate due to the increased travel time involved in the icy conditions observed there.

If you change Special Condition in the Alliance zone to Ice, the historical value averages in the Storm Report repopulate with values appropriate for an ice storm. When the next scheduled simulation iteration occurs, the events in the Alliance zone receive estimates calculated using the historical averages for Ice, while the events in all other control zones in the Stark region continue to receive estimates calculated using the historical averages for Wind/Rain.

Forecasting Outages

Outage forecasting takes into account future storm load. It provides more accurate estimated restoration projections in the early stages of a storm by simulating the expected impact of the storm. Outage forecasting can be performed in a control zone at the simulation level currently operating storm mode.

Forecasting Outages by Percentage

To perform outage forecasting by percentage, complete these steps:

1. Make sure the Forecast Mode field in the Storm Report pane is set to % Change, and the current control zone is at the simulation level.
2. Click in the % Change cell beneath the Actual Outages column.
3. Revise the percentage in the cell to the value you want to use. This value must be greater than or equal to 100%.
4. Press **Enter**.
5. Click the **Save Changes** button on the toolbar or select **Save Changes** from the System menu. The following occurs:
    - The value in the Actual Outages column for each outage category is multiplied by the percentage in the % Change row and the result is displayed in the Total Outages column for each outage type. If any outage type currently has an Actual Outages value of 0, then 0 will remain displayed in

the Total Outages column until at least one event of that outage type appears.

- New outages that enter the system reflect the forecasting percentage and update the Total Outages column accordingly.
- During the next scheduled simulation, the Storm Management estimates calculation takes into account the increased outage percentage. The modified percentage stays in place until the value in the % Change row is changed back to 100 or until storm mode is exited for the control zone.

Forecasting Outages by Value

The Total Outages column of the Storm Report is a calculated column containing the number of total forecasted outages for each outage type. When the currently selected control zone is at the simulation level and operating in storm mode, you can override the value of this column by editing individual cells within the column.

To perform outage forecasting by value, complete these steps:

1. Make sure the Forecast Mode field is set to Value and the current control zone is at the simulation level.
2. Click in the cell beneath the Total Outages column for the Outage Type whose value you wish to forecast.
3. Enter the new value.
4. Click **Enter**.
5. Click the **Save Changes** button on the toolbar or select **Save Changes** from the System menu. The following occurs:
   - The Total cell value beneath the Total Outages column updates to reflect the new sum using the modified forecast values.
   - During the next scheduled simulation, the Storm Management estimates calculation takes into account the increased number of outages.
   - As new outages enter the system, the Total Outages column stays the same until the number of Actual Outages for an outage type exceeds the number of total outages. Once that occurs, Value forecasting is no longer applied to that outage type.

   Note: If you enter an invalid value into the Total Outages column, the cell reverts to its previous value when the **Save** button is pressed.

Using Forecast Profiles

You may want to define and save one or more outage forecasting profiles to be used for analysis and resource planning prior to a storm's occurrence. You can create, edit, delete, and apply forecasting profiles by using the Forecast Profiles window.

This section includes the following topics:

- Forecast Profiles Window
- Adding a Profile
- Editing a Profile
- Removing a Profile
- Applying a Profile
- Printing Forecast Profiles

1. Forecast Profiles Window

To open the Forecast Profiles window, complete these steps:

1. Make sure the currently selected control zone is at the simulation level.
2. Do one of the following:
    - Select the **Forecast Profiles**… option from the System menu, or
    - Click the **Forecast Profiles** on the toolbar.

The Forecast Profiles window displays the following fields and buttons:

- The **Add Profile** button adds a new default row to the table in the Forecast Profiles dialog box. That default row may then be edited to contain the desired profile name and outage type values. If a row marked for removal is selected, pressing the Add Profile button will undo the removal mark. New, unsaved rows display in the table as green. Edited, unsaved rows display in the table as cyan.
- The **Remove Profile** button marks the selected row for removal from the table in the Forecast Profiles window. Rows marked for removal display in the table as red.
- The **Save Profiles** button saves any new or modified profiles, and any rows marked for removal will be deleted. If the Forecast Profiles table contains more than one row with the same profile name, an error dialog box will appear and no changes will be saved.
- The **Profile Name** column contains a unique name for the profile.
- The remaining columns correspond to each Storm Management outage type category. These columns contain the number of outages of that outage type that comprise the forecast profile.

Buttons

- The **Apply Profile** button applies the selected forecast profile values into the Total Outages column of the Storm Report pane.
- The **Print…** button brings up the Print Preview dialog box, which allows you to print out the contents of the Forecast Profiles dialog box.
- The **Cancel** button closes the dialog box without saving changes, and leaves the forecast profiles as they were.

Adding a Profile

To add a new outage forecasting profile:

1. Do one of the following:
    - Click the **Forecast Profiles** button on the toolbar, or
    - Select **Forecast Profiles** from the System menu. The Forecast Profiles dialog box opens.
2. Click the **Add Profile** button to add a new row to the Forecast Profiles table.
3. Click into the Profile Name cell of the row and specify a unique name for this profile.
4. Click in the desired outage type cells of the row and specify a number of outages.
5. Click the **Save Profiles** button. The Forecast Profiles dialog box closes and the new profile is saved for later use.

Editing a Profile

To edit an existing outage forecasting profile:

1. Do one of the following:
    - Click the **Forecast Profiles** button on the toolbar, or
    - Select **Forecast Profiles** from the System menu. The Forecast Profiles dialog box opens.
2. Click into the desired cell of the desired forecast profile and modify the profile name/outage type count.
3. Click the **Save Profiles** button. The Forecast Profiles dialog box closes and the edited profile is saved for later use.

Removing a Profile

To remove an existing outage forecasting profile:

1. Do one of the following:
    - Click the **Forecast Profiles** button on the toolbar, or
    - Select the Forecast Profiles option from the System menu. The Forecast Profiles dialog box opens.
2. Click into the any cell of the forecast profile to be removed.
3. Press the **Esc** key.
4. Click the **Remove Profile** button.
5. Click the **Save Profiles** button. The Forecast Profiles dialog box closes and the marked profile is removed.

Applying a Profile

To apply an outage forecasting profile:

1. Do one of the following:
    - Click the **Forecast Profiles** button on the toolbar, or
    - Select **Forecast Profiles** from the System menu. The Forecast Profiles dialog box opens.
2. Click into the any cell of the forecast profile to be applied.

3. Click the **Apply Profile** button. The Forecast Profiles dialog box closes, and the Total Outages column of the Storm Report for each outage type is now populated with the corresponding value from the forecast profile.
4. Click the **Save Changes** button. The Total cell value beneath the Total Outages column updates to reflect the new sum using the modified forecast values. For any outage type where the Actual Outages value exceeds the forecasted value, the Total Outages column for that outage type will instead display the Actual Outages value rather than the forecasted value.

Printing Forecast Profiles

To print the contents of the Forecast Profiles dialog box, complete these steps:

1. Do one of the following:
   - Click the **Forecast Profiles** button on the toolbar, or
   - Select **Forecast Profiles...** from the System menu. The Forecast Profiles dialog box opens.
2. Click the **Print…** button. The Print Preview dialog box opens.
3. Adjust the scale, orientation, and page setup as desired.
4. Click the **Print** button on the toolbar to print the pages. The Print Preview dialog box disappears and the print output appears at your selected printer.

Working with Crew Information

Storms create critical outage situations that make it vital to account for crew resources. For example, you may need to move a crew to a different control zone depending on the backlog of outages within each zone.

Crew Information Pane

The Crew Information pane lists all of the crews identified in Storm Management for the currently selected control zone and its children. Crews of certain skill and availability within a control zone are grouped together. Each row in the Crew Information table represents a group of crews.

Crew Information Toolbar

The Crew Information pane provides toolbar action buttons:

Button	Description
Add Crew...	The **Add Crew…** button opens the Add Crew Group dialog box, which lets you define new crew groups for the Crew Information table.
Edit Crew...	The **Edit Crew…** button opens the Edit Crew Group dialog box, which lets you change crew data for a selected crew group in the Crew Information table.
Delete Crew...	The **Delete Crew…** button removes the selected crew group from the Crew Information table. A warning dialog box opens, prompting you for confirmation before deleting.

Button	Description
Move Crew...	The **Move Crew…** button opens the Move Crew Group dialog box, used to transfer crews from the selected crew group in the Crew Information table to another control zone.
Apply Crew Change...	The **Apply Crew Changes** button saves changes made in the Crew Information table. Unapplied changes in the Crew Information table are highlighted in different colors.
Import Crews...	The **Import Crews…** button opens the Import Crews dialog box. In real-time mode, this dialog box lets you import crews from Oracle Utilities Network Management System Web Trouble into the Crew Information table. In study mode, it additionally lets you import crew group information from the real-time session or the applied manual override or outage forecasting parameters from the real-time session into study mode.

Crew Information Table

The Crew Information pane displays the following fields:

- The **# Crews** column contains the number of crews that belong to the group.
- The **Zone** column contains the name of the control zone that crew group is assigned to.
- The **Company** column contains the name of the company that the crew group works for. This column is for informational purposes and does not affect the outcome of the estimate calculations.
- The **Crew Type** column contains the type of crew within the group. This indicates the type of work performed by the crews. The options here match the crew types defined in the Crew Makeup window (see **Using Crew Makeup** on page 4-11 for details).
- The **Start Date** column contains the date and time at which each crew in the group is available for work.
- The **End Date** column contains the date and time at which each crew in the group becomes unavailable for work.
- The **Hours On** column contains the length of the shift worked by each crew in the group.
- The **Hours Off** column contains the length of time between shifts worked by each crew in the group (that is, the number of hours that the each crew in the group has off after completing each shift).

Hiding the Crew Information Table

You can hide the Crew Information table by clicking the down arrow button in the upper left corner of the pane.

Sorting the Crew Information Table

You can sort the Crew Information table in ascending or descending order according to any column in the table.

To sort the Crew Information table, click on the column heading of the column you want to sort by. The table sorts in ascending order of the selected column, and an up arrow appears on the column heading, indicating that the sort is ascending.

Click the same heading again to toggle to descending sort order. A down arrow appears, and the table re-sorts.

Applying Changes

A highlighted row in the Crew Information table indicates that there have been changes entered but not yet saved.

- Green highlighted rows are new rows that are added to the table.
- Cyan highlighted rows are rows that have been edited or updated.

A crew group may have been added, edited, moved or imported, but the changes are not permanent until you click the **Apply Crew Changes** button on the Crew Information toolbar.

Once you save the changes, the new or changed rows in the Crew Information table are no longer highlighted. If at the time of the application there are rows in the Crew Information table that contain the same data in all of their columns (except the # Crews column), then those rows are combined. The numbers of crews for each row are added together and the sum appears in the # Crews column.

If you try to change the control zone view while there are unsaved changes in the Crew Information table, a dialog box prompts you to do one of the following:

- The **Yes** button saves the changes in the Crew Information table and moves to the newly selected control zone.
- The **No** button discards the changes in the Crew Information table and moves to the newly selected control zone.
- The **Cancel** button closes the dialog box without altering the changes in the Crew Information table or moving to the selected control zone.

Importing Crews

The crew information used by Storm Management is maintained separately from that in Oracle Utilities Network Management System Web Trouble. However, crew information defined in Web Trouble can be imported into Storm Management with the Import Crews dialog box.

To open the Import Crews dialog box when in storm mode, click the **Import Crews…** button on the toolbar.

> **Note:** Changes made within Storm Management to the imported crews will not affect the data in Oracle Utilities Network Management System Web Trouble.

The Import Crews dialog box serves two functions:

- In real-time mode, it lets you import crew information from Web Trouble into the Crew Information table, based on specified filtering criteria.

- In study mode, it lets you import Web Trouble crew information, as well as the manual override/outage forecasting parameters of the currently selected control zone and any crew information from real-time mode into study mode.

Import Crews Window
The Import Crews window contains the following fields and buttons:

- Zone Information
  - The **Current Zone** field displays the name of the currently selected control zone. This field is not editable.
- Import Criteria
  - The **Reset** option, when checked, replaces all crews currently in the Crew Information table with the imported crews. When not checked, the imported crews are added to the existing data in the Crew Information table.
  - The **Real Crews** option is checked by default. This option imports crew information from Web Trouble. This option is only deselectable in study mode.
  - The **Crew Groups** option, when checked, lets you import the crew groups from the real-time session. This option is only enabled in study mode.
  - The **Parameters** option, when checked, lets you import the outage forecasting and manual overrides from real-time mode for the selected control zone. This option is only enabled in study mode.
- Filters
  - The **Zone** option, when checked, option imports only crews from the specified control zone. The button on the right opens the Control Zone Selection dialog box. (In this dialog box, select the zone you want and click **OK**.)
  - The **Company** option is only enabled when the Real Crews Import Criteria option is not selected. It imports only the crews with the Company specified in the drop-down list.
  - The **Crew Type** option, when checked, imports only the crews whose type matches the crew type specified in the drop-down list.
  - The **Real Crew Status** option, when checked, imports the crews whose status in Web Trouble matches the status specified in the drop-down list. Available crew status options are On-Shift (crew is active and currently on shift), Off-Shift (crew is active and currently off shift) and Inactive (crew is currently not active). This option is only enabled when the Real Crews Import Criteria is selected.
- The **Import** button imports the crew information and/or outage forecasting and manual override parameters as specified and closes the dialog box. In the Crew Information table, the imported data is highlighted and crews with identical parameters are automatically combined into the same group. To confirm the changes and remove the highlighting, click the **Apply Crew Changes** button.
- The **Cancel** button discards the import criteria options and closes the dialog box without importing anything.

How to Import Crews
To import crews, complete these steps:

1. Make sure the currently selected control zone is operating in storm mode.
2. Click **Import Crews…** on the Crew Information toolbar.
3. Select the import criteria and filters for the crews you want to import.
4. Click **Import**. If an imported crew is not an identical match to any existing crew group rows in the Crew Information table, then it's added to the table as a new row and highlighted in green. If an imported crew is an identical match to any existing crew group rows in the Crew Information table, then the number of crews in the existing crew group row is incremented and the row is highlighted in cyan.
5. To apply the changes, click the **Apply Crew Changes** button on the toolbar.

Example of Importing Crews
The highlighted rows in the Crew Information table below show the results of importing crews into real-time without using the Reset option. The Hours On and Hours Off values default to 8 and 16 respectively for any crew information imported from Web Trouble.

- Green highlighted rows are new rows that are being added to the table.
- Cyan highlighted rows are crew groups that are having crews added to them. The # Crews column has been increased to reflect the new number of crews in the group.

  Note: The End Date column is not populated because there is no corresponding value defined in Web Trouble.

Adding Crew Groups

You can add new crew groups to Crew Information table using the **Add Crew** dialog box. To open the **Add Crew** dialog box, click the **Add Crew…** button on the toolbar.

- **Details Pane**
  - The **Zone** field is the control zone that the crew group is assigned to. The default value is the control zone that Storm Management is currently viewing. The button on the right opens the Control Zone Selection dialog box. (In this dialog box, click on the zone you want and click **OK**.)
  - The **Company** drop-down list is the name of the company that the crew group works for. This column is for informational purposes and does not affect the outcome of the estimate calculations.
  - The **Crew Type** drop-down list is the type of crew within the group. This indicates the type of work performed by the crews. The options here match the crew types defined in the Crew Makeup window of Web Trouble.
  - The **# Crews** field allows you to specify the number of crews that belong to the group.
- **Schedule**
  - The **Start Date** field is the date and time at which each crew in the group is available for work.
  - The **Avail Until** field is the date and time at which each crew in the group becomes unavailable for work.

- The **Hours On** field allows you to specify the length of the shift worked by each crew in the group, beginning at the Start Date.
- The **Hours Off** field allows you to specify the length of time between shifts worked by each crew in the group (that is, the number of hours that the each crew in the group has off after completing each shift).

- The **OK** button confirms the details and schedule for the new crew group, inserts the information into the Crew Information table, and closes the dialog box. You must save the new crews by clicking the **Apply Crew Changes** button or selecting the **Apply Crew Changes** option from the Crew menu.
- The **Cancel** button discards the details and schedule and closes the dialog box without inserting any information.

When there is at least one crew in the table, right-click to select the row in the Crew Information table and display the context menu .

- The **Copy Crew** option copies the selected row in the Crew Information table.
- The **Paste Crew** option inserts the copied crew into the Crew Information table below the current line.
- The **Add Crew** option inserts a new row into the Crew Information table containing default values. Once the new row is added, you can change the values in each column.

Adding Crew Groups with the Right-Click Context Menu

You can add crews directly in the Crew Information table by using the right-click context menu. To do this, complete these steps:

1. Right-click in the Crew Information table. The context menu appears, with the **Add Crew** option enabled.
2. Select **Add Crew**. A new row appears in the Crew Information table with the default values, highlighted in green.

Editing Crew Groups Using Edit Crew

Once you have imported or added crew groups, you can modify the details of a crew group. Modify crew information using the Edit Crew Group dialog box.

1. Click the **Edit Crew…** button on the toolbar to open the Edit Crew Group dialog box. The Edit Crew Group dialog box contains the same fields as the Add Crew Group dialog box. The fields are populated with data from the selected row of the Crew Information table.
2. Modify the crew as necessary and click **OK** to update the Crew Information table.
3. To apply the modifications, click the **Apply Crew Changes** button.

Editing Crew Groups within the Crew Information Table

You can also edit crews directly in the Crew Information table. To do this, complete these steps:

1. Click the cell of the row that you want to edit. Depending on the type of data in the cell, one of the following occurs:
   - A cursor appears within the cell.
   - A dialog box opens for you to select a new date and/or time.

- A Control Zone Selection dialog box opens.
- A drop-down list opens.

2. Make changes by either editing the value in the cell or selecting from the dialog box or drop-down list. (In the Control Zone Selection dialog box, click on the zone you want and click **OK**. In the Date/Time field, select a new date/time. The edited row becomes highlighted in cyan.
3. Click **Apply Crew Changes**. The following occurs:
   - Your edits are saved.
   - The row is no longer highlighted.
   - The changes are used during the next scheduled simulation iteration.

Deleting Crew Groups

To delete a crew group from the Crew Information table, complete these steps:

1. Select the crew group in the Crew Information table.
2. Click the **Delete Crew** button.

   A message box opens, requesting confirmation that the selected crew group should be permanently deleted.
3. Click **Yes** to confirm the delete. The crew group disappears from the Crew Information table.

   Note: The **No** button cancels the delete.

Moving Crew Groups to a Different Control Zone

Each crew group is assigned to a specific control zone when it is created. During your analysis, you may want to adjust your crew resource allocation by reassigning crews to different control zones. The Move Crew Group dialog box enables you to move all or part of the crews within a selected crew group to different control zones.

To open the Move Crew Group dialog box, select a crew group from the Crew Information Table and click the **Move Crew…** button. The Move Crew Group window contains the following fields and buttons:

- The **Company** field displays the name of the company that the crew group works for. This field is not editable.
- The **Crew Type** field displays the type of crew within the group. This indicates the type of work performed by the crews. It matches the crew types defined in the Web Trouble Crew Makeup window This field is not editable.
- The **From Zone** field displays the current control zone of the selected crew group. This field is not editable.
- The **To Zone** is the control zone that the specified number of crews is moving to. The button on the right opens the Control Zone Selection dialog box. (In this dialog box, click on the zone you want and click **OK**.)
- The **# Crews** field allows you to specify the number of crews within the selected crew group to move to the new control zone. If you enter a number greater than the number of existing crews, an error will occur when you click **OK**.
- The **OK** button confirms the details of the move and closes the dialog box. If all of the crews in a group are being moved, the original crew group row now

appears highlighted in cyan with the control zone modified. If only part of the crews is being moved from a crew group, the original group row is now highlighted in cyan with the number of crews decreased appropriately. A new crew group row appears highlighted in green with the number of specified crews to move and new control zone (all other fields in the row are the same as the original crew group).

- The **Cancel** button discards the details about the move and closes the dialog box without saving any information.

To move crews, complete these steps:

1. Select a crew group row in the Crew Information Table.
2. Click the **Move Crew…** button. The Move Crew Group dialog box opens.
3. Click the zone selection button on the right of the To Zone field. The Control Zone Selection dialog box opens.
4. Select the control zone you want to move the crews to and click **OK**. The Control Zone Selection dialog box closes, and the zone you selected populates the To Zone field.
5. If you only want to move part of the crews in the group, enter the number of crews you want to move in the # Crews field.
6. Click **OK**. The dialog box closes.

   If all of the crews in a group are being moved, the original crew group row now appears highlighted in cyan with the control zone modified.

   If only part of the crews is being moved from a crew group, the original group row is now highlighted in cyan with the number of crews decreased appropriately. A new crew group row appears highlighted in green with the number of specified crews to move and new control zone (all other fields in the row are the same as the original crew group).
7. Click the **Apply Crew Changes** button. The following occurs:
   - The crew groups are moved to their assigned control zones.
   - The modified rows are no longer highlighted.
   - The updated information is used during the next scheduled simulation iteration.

Moving Entire Crew Groups Using the Table Edit Features

You can also move a crew group by clicking directly in the Zone field of the crew group row and changing the control zone. To move a crew group in this way, complete these steps:

1. Click in the Zone field for the crew group you want to move. The row becomes selected, and the Control Zone Selection dialog box appears.
2. Select the zone you want to move the crew group to and click **OK**.
3. Click in a different field of the row. The Zone field updates to reflect the zone you selected, and the row becomes highlighted in cyan.
4. Click **Apply Crew Changes**. The modified row moves to its new control zone and is no longer highlighted. The updated information is used during the next scheduled simulation iteration.

Moving Partial Crew Groups Using the Right-Click Context Menu

You can also move partial crew groups directly from the Crew Information table. To do this, complete these steps:

1. Select a crew group row in the Crew Information Table.
2. Copy the crew group by selecting the **Copy Crew** option from the context menu.
3. Paste the crew as a new row by selecting the **Paste Crew** option from the context menu.
4. Edit the Control Zone in the new row.
    - Click the **Zone** cell to select it and then click again to edit it.
    - Click the select zone button ( ) to open the Control Zone Selection dialog box. Select the new control zone and click **OK**.
5. Edit the **# Crews** cell in the original row.
6. Edit the # Crews cell in the new row.
7. Click **Apply Crew Changes**. The following occurs:
    - The new row moves to its assigned control zone.
    - The modified rows are no longer highlighted.
    - The updated information is used during the next scheduled simulation iteration.

Using Study Mode

While in Storm Mode, you may enter study mode, which enables you to manipulate parameters that affect the estimate calculations, such as outage forecasting, manual overrides and crew information, without altering the current real-time calculations.

This section includes the following topics:

- Entering Study Mode
- Calculating Crew Resources
- Importing Crews and Parameters
- Exporting Crews and Parameters
- Calculating Estimates in Study Mode
- Exiting Study Mode

Entering Study Mode

To toggle between study mode and real-time mode, do one of the following:

- Select **Toggle Study Mode** from the Storm menu, or
- Click the **Toggle Study Mode** button on the toolbar.

You can only enter study mode from a control zone that is currently in storm mode.

The first time you enter a study session, several portions of the Storm Management window are not populated as they were in the real-time session:

- The Summary Information table's Est Assessed By and Est Restored By columns are empty.

- The Storm Report table's Total Time to Assess and Total Time to Restore columns display zeros.
- The Storm Report table's Estimated Assessed By and Estimated Restored By columns are empty.
- Outage forecasting parameters that existed in the real-time session are not applied.
- Manual overrides that existed in the real-time session are not applied.
- The Crew Information table is empty.
- The Last Update field of the status bar does not contain a time.

Once you create a study session, it remains active throughout the storm. You may find a need to toggle between study and real-time modes repeatedly during a storm. Each time you re-enter study mode, Storm Management loads the saved data saved from the most recent visit to the study session.

The status bar at the bottom of the Storm Management window identifies the current operating modes, as shown below for study, storm mode.

When in study mode, the window's refresh interval is disabled, and estimate calculations using the data in the study mode session must be triggered manually. However, the system does continue to make real-time estimate calculations for all control zones.

Calculating Crew Resources

In storm mode, Storm Management can calculate the approximate number of crews that the system requires to complete assessment and restoration in the currently selected control zone by a specified date. You can enter variables used in the calculation and see the results in the Calculate Crews dialog box.

To open the Calculate Crews dialog box, do one of the following:

- Select **Calculate Crews** from the Storm menu when in storm mode, or
- Click the **Calculate Crews…** button on the toolbar.

The Calculate Crews dialog box displays the following fields and buttons:

- The Assessment **Desired Date** field contains the assessment completion time you want to achieve. The button on the right of this field opens a calendar that enables you to select a date and time. You must select a date and time later than the current time. The value you enter (and the system uses) displays in the upper left corner above the Used Crews table after the results are calculated. You may leave this field blank if you wish to Calculate Crews for Repair only.
- The Assessment **Work Efficiency (%)** field contains the efficiency of the assessment crews as a percentage. This value affects the amount of work to be completed and is applied along with performance factor values associated with the crew type. You must specify the assessment work efficiency as a percentage between 1 and 100. The value you enter (and the system uses) displays to the right of the Estimated Assessed By date above the Used Crews table after the results are calculated.
- The Repair **Desired Date** field contains the repair completion time you want to achieve. The button on the right of this field opens a calendar that enables you to select a date and time. You must select a date and time later than the current time. The value you enter (and the system uses) displays to the left of the Repair

Eff percentage above the Used Crews table after the results are calculated. You may leave this field blank if you wish to Calculate Crews for Assessment only.

- The Repair **Work Efficiency (%)** field contains the efficiency of the repair crews as a percentage. This value affects the amount of work to be completed and is applied along with performance factor values associated with the crew type. You must specify the assessment work efficiency as a percentage between 1 and 100. The value you enter (and the system uses) displays above the right corner of the Used Crews table after the results are calculated.
- The **Hours** field contains the number of hours that equal one crew unit. The results are returned in crew units rounded to the next whole integer. The value entered and used by the calculation displays above the Available Crews table.
- The **Calculate Crews** button calculates the number of crews based on the specified data. It populates the Used Crews and Available Crews panes with the results.
- The **Reset** button resets the entries in the Assessment Desired Date and Work Efficiency, the Repair Desired Date and Work Efficiency, and the Crew Unit Hours fields back to their default values.
- The **Print…** button brings up the Print Preview dialog box, which allows you to print out the contents of the Calculate Crews dialog box.
- The **Cancel** button closes the dialog box.
- The **Outage Types** column contains the name of the Storm Management outage type category.
- The **Assessment Units Existing** column contains the number of existing assessment crews units that can assess each outage type by the specified date.
- The **Assessment Units Needed** column contains the number of additional assessment crew units needed to assess each outage type by the specified date.
- The **Assessment Units Total** column contains the total number of assessment crew units needed to assess each outage type by the specified date.
- The **Repair Units Existing** column contains the number of existing repair crews units that can repair each outage type by the specified date.
- The **Repair Units Needed** column contains the number of additional repair crew units needed to repair each outage type by the specified date.
- The **Repair Units Total** column contains the total number of repair crew units needed to repair each outage type by the specified date.
- The **Crew Type** column indicates the type of work performed by the crews. It matches the crew types defined in the Crew Makeup window of Oracle Utilities Network Management System.
- The **Unused Units** column contains the number excess crew units for each crew type that are found to exist by the calculation.
- The **Total Units** column contains the total number of units for each crew type that are found to exist by the calculation.

Calculating Crews Needed to Assess and Restore Outages by a Given Time

To calculate the number of crew units needed to assess and repair all events in the currently selected control zone by a specific time, complete these steps:

1. From a control zone in storm mode, do one of the following:
    - Select **Calculate Crews** option from the Storm menu, or
    - Click the **Calculate Crews…** button on the toolbar.
2. Click on the Assessment Desired Date calendar button.
3. From the calendar dialog box, select the date and time you want all assessment completed by and click **OK**.
4. Select the percentage in the Assessment Work Efficiency (%) field and type the percentage you want to use.
5. Click the **Repair Desired Date** calendar button.
6. From the calendar dialog box, select the date and time you want all repair completed by and click **OK**.
7. Select the percentage in the Repair Work Efficiency (%) field and type the percentage you want to use.
8. Click the **Calculate Crews** button. Storm Management estimates the number of crew units needed and available and displays the results in the Used Crews and Available Crews tables.

Printing Calculate Crews Results

To print the contents of the Calculate Crews dialog box, complete these steps:

1. Do one of the following:
    - Click the **Calculate Crews** button on the toolbar, or
    - Select **Calculate Crews...** option from the System menu. The Calculate Crews dialog box opens.
2. Click the **Print…** button. The Print Preview dialog box opens.
3. Adjust the scale, orientation, and page setup as desired.
4. Click the **Print** button to print the pages. The Print Preview dialog box disappears and the print output appears at your selected printer.

Importing Crews and Parameters

In study mode, the Import Crews dialog box has additional options not available in real-time mode. It enables you to import Web Trouble crew information, as well as the manual override/outage forecasting parameters of the currently selected control zone and any crew information from real-time mode into study mode.

Importing Real-Time Crews and Parameters into the Study Session

To open the Import Crews dialog box, click the **Import Crews…** button above the Crew Information table.

The following fields are only activated in study mode:

- The **Crew Groups** option, when checked, enables you to import the crew groups from the real-time session.

- The **Parameters** option, when checked, option enables you to import the outage forecasting and manual overrides from real-time mode for the selected control zone.
- The **Company** option is only enabled when the Real Crews Import Criteria option is not selected. It imports only the crews with the Company specified in the drop-down list.

Once you click the **Import** button, Storm Management Crew Information pane looks and behaves as it does in real-time mode.

The window below shows how the Crew Information table would look if real-time crew groups are imported with no filters. All of the real-time crews are imported.

Importing Real-Time Session Information into the Study Session

To import crews, complete these steps:

1. Make sure the currently selected control zone is operating in study mode.
2. Click **Import Crews…**.
3. Uncheck the Real Crews option under the Import Criteria section.
4. Check the Crew Groups option under the Import Criteria section.
5. Check the Parameters option under the Import Criteria section.
6. Click **Import**. The following occurs:
    - Any outage forecasting and manual override parameters that exist for this control zone in the real-time session are applied to the Storm Report table, but not yet saved.
    - The Save Changes button in the toolbar becomes sensitized.
    - The Crew Information table is now populated with the crew groups that exist for this control zone in the real-time session. If an imported crew is not an identical match to any existing crew group rows in the Crew Information table, then it's added to the table as a new row and highlighted in green. If an imported crew is an identical match to any existing crew group rows in the Crew Information table, then the number of crews in the existing crew group row is incremented and the row is highlighted in cyan.
7. Apply the outage forecasting and manual override changes by either:
    - Clicking the **Save Changes** button on the toolbar, or
    - Selecting Save Changes from the System menu.
8. Apply the Crew Info table changes by clicking **Apply Crew Changes**.

The Crew Information table updates to display only those crews belonging to the currently selected control zone. The crew groups that are removed from the current view are saved in the study session for their appropriate control zones. You can view them by selecting their control zone from the Zone Selection tree.

Resetting the Current Study Session to Match the Real-Time Session

In the course of working with the study session, the user may want to start over by resetting the state of the study session to the current state of the real-time session.

1. To reset the study session, do one of the following:
    - Click the **Reset Study Session** button on the toolbar, or

- Select **Reset Study Session** from the Storm menu.

The Reset Study Session confirmation dialog box will appear.

2. Click the **Yes** button on the confirmation dialog box to proceed. The confirmation dialog box closes. The Crew Information table updates with the crews defined in the real-time session. Special Condition, Forecast mode and override information in the Storm Report table are also updated to match the real-time session.

   Note: This operation affects all control zones, not just the currently selected zone.

Exporting Crews and Parameters

Once the user is satisfied with the simulation parameters in study mode, the parameters can be exported back into the real-time session.

To export the study session parameters, complete these steps:

1. Do one of the following:

   - Click the **Export Study Session** button on the toolbar, or
   - Select **Export Study Session** from the Storm menu.

   The Export Study Session confirmation dialog box appears.

2. Click the **Yes** button on the confirmation dialog box to proceed. The confirmation dialog box closes. The contents of the Crew Information as well as Special Condition, Forecast mode and override information in the Storm Report table are copied into the real-time session.

   Note: This operation affects all control zones in the real-time session, not just the currently selected zone.

Calculating Estimates in Study Mode

Because estimate calculations using the data in the study mode session must be triggered manually, you must use the **Force Simulation Run** button to calculate the results.

Note: While you are working in study mode, Storm Management continues to calculate restoration times for control zones operating in real-time.

To calculate estimates in study mode, do one of the following:

- Select **Force Simulation Run** option from the System menu, or
- Click the **Force Simulation Run** button on the toolbar.

The Summary Information table and Storm Report table update to display the estimates. The status bar indicates the time at which the forced simulation was last executed in the study session.

Note: Each time you make changes in the Storm Management window in study mode, you must press the **Force Simulation Run** button in order to view the results of the changes. Because every time you press the **Force Simulation Run** button causes Storm Management to completely re-analyze and calculate estimates for all events in the system, forcing a simulation could slow down system performance at times. It is recommended you keep forced simulations at a minimum.

When Storm Management completes a forced simulation in real-time mode, a confirmation message is displayed.

Note: Once you've found the optimal settings in your study session, you must manually re-enter them into real-time mode to apply them to the storm.

Exiting Study Mode

To exit study mode, do one of the following:

- Click the **Toggle Study Mode** button on the toolbar, or
- Select **Toggle Study Mode** from the Storm menu.

If there are unsaved changes, a dialog box opens prompting you for options to save the changes.

Note: You must exit study mode before you can exit storm mode.

Exiting Storm Mode

To exit storm mode for a selected control zone, do one of the following:

- Select the Toggle Storm Mode option from the System menu, or
- Click the **Toggle Storm Mode** button on the toolbar.

These options are only available if the currently selected control zone is operating in real-time mode and storm mode.

Define Storm Dialog

Once you press the Toggle Storm Mode, the Define Storm dialog box opens, prompting you for the End Date of the storm in this zone.

The Define Storm dialog box displays the following fields:

- The **Zone** field displays the name of the currently selected zone. This control zone and all of its children that aren't already in non-storm mode will be placed into non-storm mode, ending the storm in this zones. This field is not editable.
- The **Storm Name** field displays the name of the storm. This field is not editable.
- The **Special Condition** field displays a storm type that indicates a predefined condition existing with the storm. This condition may also dictate a different set of historical average values be used in the estimate calculations made by the system. This field is not editable.
- The **Storm Level** field displays the severity level for the storm. This value is recorded for information and reporting purposes only and has no effect on the estimate calculations. This field is not editable.
- The **Start Date** field displays the date time at which the storm started in this zone. This field is not editable.
- The **End Date** field contains the date and time at which the storm ended in this zone. When you deselect the **Use Current Time** option, the Date/Time field becomes editable. Valid dates and times are those prior to (and including) the current time. If your entry is invalid, an error message appears. Click **OK** to close the message and correct the error.
- The **Use Current Time** check box is selected by default. This option allows you to leave the End Date field blank and have the current system time on the server be used as the End Date of the storm in this zone.

Setting the Storm End Date

To set the storm's end date, complete these steps:

1. Select a date and time for the storm's end date. Either:
    - Leave the **Use Current Time** option selected.
    - Deselect the **Use Current Time** option. Edit the date/time in the Date/Time field. Click **OK**. Valid dates are those between the start date and time of the storm and the current date and time.
2. Click the **Ok** button on the Define Storm dialog box.
    - Storm Management returns to non-storm mode for the selected control zone.
    - If the control zone had any child zones in the same storm, the child zones are also returned to non-storm mode.

Note: The **Cancel** button discards the End Date without saving it. The Define Storm dialog box closes and the currently selected control zone stays in storm mode.

Storm Management View Only Environment

The Storm Management View Only environment is available for users who do not have a need to manipulate the various parameters on the Storm Management window, but rather need to monitor and analyze the information that is presented. To access the Storm Management View Only environment, login with View Only user type.

View Only Environment User Interface

View Only Menus

There are three menus on the View Only Storm Management menu bar: System, Storm, and Help.

Menu

The options in the System menu are available in both storm and non-storm modes. The following table describes the System Menu options and associated toolbar icons.

Menu Option	Description	Toolbar Icon
Retrieve Update	Refreshes the window with the most recent information from the system.	
Print All…	Opens the Print Preview dialog box, which allows you to print out the Summary Information pane, Storm Report pane, Storm Information pane (if present), Crew Information pane (if present), and status bar information from the current Storm Management window.	
Print Crews…	Opens the Print Preview dialog box, which allows you to print out the Crew Information pane from the current Storm Management window. This option is only available in storm mode.	

Storm Menu

The option in the Storm menu is only enabled when Storm Management is in storm mode for the selected control zone.

The following table describes the Storm Menu options.

Menu Option	Description	Toolbar Icon
Calculate Crews...	Opens the Calculate Crews dialog box, which is used to determine the approximate number of crews needed to complete assessment and repair by a specified date and time.	

View Only Help Menu

The Help menu options are Storm Management Help, which opens the online help content for Storm Management, and About Storm Management, which displays information regarding the version of the application and the Web Gateway.

View Only Toolbar

The Storm Management toolbar provides a shortcut to many of the options available from the Storm Management menus.

The View Only Storm Management toolbar displays the following buttons.

- The **Retrieve Update** button refreshes the window with the most recent information from the system. In most cases, the window refreshes itself on a periodic basis. But, if there are unsaved changes in the Storm Management window at the time the automatic refresh is due to occur, the window will not refresh. Instead, an alert appears in the status bar indicating that an update is available, and the Retrieve Update option must be invoked in order to refresh the window with the new update. This allows you to continue on with your changes and save them first before refreshing.
- The **Calculate Crews** button opens the Calculate Crews dialog box, which is used to determine the approximate number of crews needed to complete assessment and repair by a specified date. This option is only available in storm mode.

Storm Management Storm Administration Environment

Upon completion of a storm (that is, all of the control zones belonging to the storm have been transitioned back to the non-storm mode of operation), authorized users can change completed storm data with Storm Management's Administration window. Users can view completed storm records and make changes to the control zone, storm type, storm level, beginning and ending dates of the storm, and define an excludable period for the storm (portion of a storm that can be excluded when reporting reliability metrics).

You can open the Administration window by clicking the Storm Management icon found under the appropriate program group in your Windows Start Menu, or by double clicking the Storm Management icon on your desktop (depending upon how it was installed). The Storm Management Login window will appear.

Login with a User Type of "Storm Administration" to proceed to the Administration window.

Administration Environment User Interface Features

Administration Menus

The Storm Administration environment provides the following menus:

- Administration System Menu
- Administration Help Menu
- Administration Logout Menu

Administration System Menu

The options in the System menu are available at all times. The following table describes the System Menu options.

Option	Description	Toolbar Icon
Revert Changes	Reloads the most recently saved records from the database.	
Save	Saves any changes made to the table.	
Excludable Period...	Opens the Excludable Period dialog box, which allows to specify excludable period for the selected record.	
Print…	Opens the Print Preview dialog box, which allows you to print out the contents of the Storm Administration table.	

Administration Help Menu

The Help menu provides links to online help content for Storm Management and information about the application, including release version and the Web Gateway that the application is using.

Administration Logout Menu

Provides the User Logout option. If you try to exit the window while there are unsaved changes in the table, a dialog box prompts you to save changes. Click **Yes** to save the changes in the table and exits the window. Click **No** to discard the changes in the table and exits the window. The **Cancel** button closes the dialog box without altering the changes in the table or exiting the window.

Storm Administration Table

The Storm Administration table displays the following fields and buttons:

- The **Storm Name** column contains the name of the storm as defined in the Define Storm dialog box. This field is not editable.
- The **Zone** column contains the name of the control zone affected by this storm. Unless explicitly defined elsewhere in the table, all of the children of the control zone are considered part of this storm as well.
- The **Special Condition** column contains the storm type indicating a predefined condition of the storm, as defined in the Define Storm dialog box.
- The **Start Date** column contains the date and time when the storm began in the zone, as defined in the Define Storm dialog box.
- The **End Date** column contains the date and time when the storm ended in the zone, as defined in the Define Storm dialog box.
- The **Storm Level** column indicates the severity of the storm, as defined in the Define Storm dialog box.
- The **Excludable Period Start Date** column contains the start date and time of the portion of the storm that can be excluded when reporting reliability metrics.
- The **Excludable Period End Date** column contains the end date and time of the portion of the storm that can be excluded when reporting reliability metrics.
- The **Excludable Period Comment** column contains the comments for this excludable period.

Printing the Storm Administration Table

To print the contents of the Storm Administration table, complete these steps:

1. Do one of the following:
    - Click the **Print Preview** button on the toolbar, or
    - Select **Print...** option from the System menu. The Print Preview dialog box opens.
2. Adjust the scale, orientation, and page setup as desired.
3. Click the **Print** button to print the pages. The Print Preview dialog box disappears and the print output appears at your selected printer.

Editing Storm Records

The Storm Administration window has many of the same editing capabilities as Storm Management's Crew Information table. The behavior of the editable field depends on the type of data in the field. When you right-click in a row, the context menu provides the following options:

- The **Cut Row** option removes the selected row from the table. You can paste the removed row back into the table with the **Paste** option. The row stays available for pasting until a new row is copied or cut from the table.
- The **Copy Row** option copies the selected row, enabling you to paste it into the table with the **Paste** option. The selected row that was copied remains in the table.
- The **Paste Row** option inserts the copied or cut row into the table.
- The **Delete Row** option removes the selected row from the table. The removed row cannot be pasted back into the table. To undo a deletion, you must select the Revert Changes option from the **System** menu to restore the table to its last saved state.

Example

The steps below show an example of how you can add new data to the Storm Administration window:

1. Select the row in the table that pertains to the storm whose data you want to change.
2. Copy the row and paste it in the table using the right-click menu.
3. Click in the Zone, Start Date, or End Date column. A cursor appears and you can enter new data.
4. Click in the Special Condition or Storm Level column. A drop-down list appears with a list of eligible choices for you to select from.
5. Click the **Save** button to keep the changes. Storm Management validates the entries. If any of the following conditions is true, an error dialog box appears and changes are not saved:
    - A storm has multiple entries for the same control zone.
    - An invalid Start Date or End Date is entered (that is, Start Date is later than End Date or End Date is earlier than Start Date).
    - A storm has both an entry for a parent control zone and child control zone where the parent zone's Start Date is earlier than the child zone's Start Date.

(Having both a parent and child control zone entry for the same storm with different Start Dates would indicate that the child zone was placed into storm mode within Storm Management first, and then later the parent zone was placed into storm mode within Storm Management. The parent zone entry would have to be removed and replaced with entries for each child zone if it's desired to record that one of the children had a later Start Date than the rest of the zones within that parent.).

- A storm has both an entry for a parent control zone and child control zone where the parent zone's End Date is earlier than the child zone's End Date. (Having both a parent and child control zone entry with different End Dates for the same storm would indicate that the child zone was placed back into non-storm mode within Storm Management first, and then later the parent zone was placed into non-storm mode within Storm Management. The parent zone entry would have to be removed and replaced with entries for each child zone if it's desired to record that one of the children had a later End Date than the rest of the zones within that parent.)

Excludable Period Dialog

Excludable Period Dialog allows you to set or clear excludable period for multiple records that are part of the same storm.

The excludable period is the portion of a storm that can be excluded when reporting reliability metrics.

- The **Period Start** date entry field allows you to enter the excludable period start date. When the dialog box is opened, this field is populated with the excludable period start date for the selected record. If excludable period is not set, the field is populated with the storm start date.
- The storm start date reset button resets the **Period Start** field to the storm start date.
- The **Period End** date entry field allows you to enter the excludable period end date. When the dialog box is opened, this field is populated with the excludable period end date for the selected record. If the excludable period is not set, the field is populated with the storm end date.
- The storm end date button resets the **Period End** field to the storm end date.
- The **Comment** text area allows you to enter an optional comment for the excludable period.
- The **Set** button sets the excludable period for the selected storm record and all the records in the child control zones for the same storm. The dialog box closes when this button is clicked.
- The **Clear** button clears the excludable period for the selected storm record and all the records in the child control zones for the same storm. The dialog box closes when this button is clicked and any data entered in the dialog box is discarded.
- The **Help...** button opens the help page for this dialog box.
- The **Cancel** button closes the dialog box without making any changes.

Understanding Storm Management Calculations

Storm Management enables you to analyze restoration times during high volume outage periods, such as those that occur during and following ice storms, thunderstorms, hurricanes, and other widespread disturbances. It can provide estimated assessment and restoration times for every outage in the system. It calculates estimates by periodically simulating the entire restoration process, taking into account the dynamically changing outage predictions and crew resource allocation. These restoration estimates can be used to manage workloads and prioritize crew assignments.

This section provides a detailed explanation of the algorithms and data Storm Management uses to create estimates. It includes the following topics:

- How Storm Management Works
- Non-Storm Mode Algorithm
- Storm Mode Algorithm

How Storm Management Works

Storm Management has two basic modes of operation – non-storm and storm mode. The estimate calculation algorithm for each mode is fundamentally the same. For example, both modes use historical averages and simulated restoration calculation/analysis of all unrestored events in the system for the estimate calculation algorithm. However, non-storm mode does not attempt to make crew backlog calculations, making its analysis much simpler.

Historical Averages

The estimate calculation algorithm uses the following historical average minutes data that applies to the different parts of the restoration process:

- **Average travel time for an assessment crew**: how long it takes a crew that is going out to assess the event to arrive onsite, once en route.
- **Average assessment time**: how long it takes a crew to assess the event, once onsite.
- **Average travel time for a repair crew**: how long it takes a crew that is going out to repair the event to arrive onsite, once en route.
- **Average repair time**: how long it takes a crew to repair/restore the event, once onsite.
- **Average cleanup time**: how long it takes before a crew is ready to move on to their next assignment, once the repair/restoration is complete.

The historical average minutes can be broken down by various factors for further granularity of data:

- **Control Zone.** The area the event is in (for example, urban versus rural) may have an affect on how long it takes crews to arrive, and thus you may use different travel times for different control zones.

  Note: One of the levels in the control zone hierarchy is designated as the control zone level at which the historical average minutes data is associated. This control zone level is herein referred to as the *simulation*

level. For example, if the second level in the control zone hierarchy – the Region level – was the designated simulation level, that would imply that each region would have its own, possibly unique, set of historical average minutes.

- **Outage Type.** The type of outage (for example, service outages, breaker lockouts, and so on) dictates how long it is going to take for repair/restoration, so, consequently, you may use different repair/restore times for different types of outages.
- **Shift.** The time of day (for example, afternoon rush hour versus middle of the night) may have an affect on how long it takes crews to arrive, and/or perform the assessment or repair/restoration, and, therefore, you may use different travel, assessment, and repair/restore times for different shifts.
- **Day Type.** The type of day (weekday versus weekend versus holiday) may have an affect on how long it takes crews to arrive, and thus you may use different travel times for different day types.
- **Season.** The time of year (for example, winter versus summer) may have an affect on how long it takes crews to arrive, and/or perform the assessment or repair/restoration, and thus you may use different travel, assessment, and repair/restore times for seasons.
- **Storm Type.** Particular weather conditions (for example, ice) may have an affect on how long it takes crews to arrive, and/or perform the assessment or repair/restoration, and thus you may use different travel, assessment, and repair/restore times for different types of storms.

Simulation

To generate estimates, the trouble analysis engine periodically goes through a simulated restoration calculation/analysis of all unrestored events in the system. Any events eligible to be assigned an estimated assessment and restoration time by Storm Management (that is, the events are of a type that Storm Management is configured to recognize, and they have not been given a manually-entered estimated restoration time from a crew/dispatcher) are sorted in priority order (part of the Storm Management configuration). Then, starting at the top of that list, the simulation begins. The event at the top of the list is examined. The mode of operation that the control zone in which the event resides is checked in order to determine which version of the algorithm is being applied to calculate the Estimated Restoration Time (ERT). The appropriate set of historical average minutes for the event is looked up, using the various characteristics such as control zone, outage type, storm type, and when the assessment and repair/restoration is projected to begin. Those historical averages are then used by the calculation of the appropriate algorithm to generate an estimated assessment time and estimated restoration time for the event.

The raw ERT value generated by the simulated restoration calculation can be further refined before becoming event's estimated restoration time.

If configuration rule ‘ertAggregationPolicy' is set to *LATEST*, then all events estimated by Storm Management of the same type and at or under the same control zone at the aggregation level, are given the same ERT. That ERT is the latest Storm Management calculated ERT among these events. After aggregation, if configuration rule ‘stormmanEstimateRounding' is enabled, the ERT value can be rounded.

Once an event has been given its estimates by the Storm Management simulation, it is removed from that priority-sorted list, and then the next event on the list is analyzed in

the same manner, and the process continues until the last event on the list is removed. When the next simulation period occurs, the process starts over again. And when it does, the previously calculated estimates for many events may change, due to factors such as some previously unrestored events now being restored, new events of varying priority appearing, crews arriving onsite at various events, some events being given manually-entered estimated restoration times, no crew yet arriving onsite, or to various parameters on the Storm Management window being modified since the last iteration.

Storm Management Window

Because the engine that generates the estimated assessment and restoration times for each event is a separate process, you do not need to have a Storm Management window open in order for the estimates to be calculated. The main purpose of the Storm Management window is to enable you to monitor and analyze the estimates from overall control zone perspective, and to manipulate several of the parameters that are used to generate the estimates.

Given that it's not required to have a Storm Management window open to generate the estimates, after each periodic calculation of the estimates, the results are not pushed out to the Storm Management windows by the engine. Instead, each Storm Management window that's open has its own timer that it uses to periodically retrieve the latest information from the engine automatically.

Non-Storm Mode Algorithm

For an event that resides in a control zone that is operating under non-storm mode, the calculation of its estimated assessment and estimated restoration times is as follows:

- Look up the historical average values that pertain to an event with its characteristics.
- Verify whether or not an assessment has already been made for the event (if JOBS.ACT_ASSESS_TIME is non-null).

If assessment has been made:

- The repair time assessment provided (JOBS.EST_REPAIR_MINUTES) will be used in the calculation rather than the historical Repair average.
- Verify whether or not a crew is currently onsite for this event.
- If a crew is onsite:
  - Check the crew type to verify whether or not this type of crew is one that can repair this event.
  - If crew can repair:
    - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The actual repair time assessment (JOBS.EST_REPAIR_MINUTES) is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event.
  - If crew cannot repair:
    - It is assumed that the onsite crew is there to perform the assessment, and another crew must be sent out to perform the repair. The historical Travel to Repair average and the actual repair time assessment are added to the time at which the repair time assessment was provided (JOBS.ACT_ASSESS_TIME) to generate the estimated restoration time (ERT) for the event.
  - If a crew is not onsite:
    - The historical Travel to Repair average and the actual repair time assessment are added to the time at which the repair time assessment

was provided (JOBS.ACT_ASSESS_TIME) to generate the estimated restoration time (ERT) for the event.

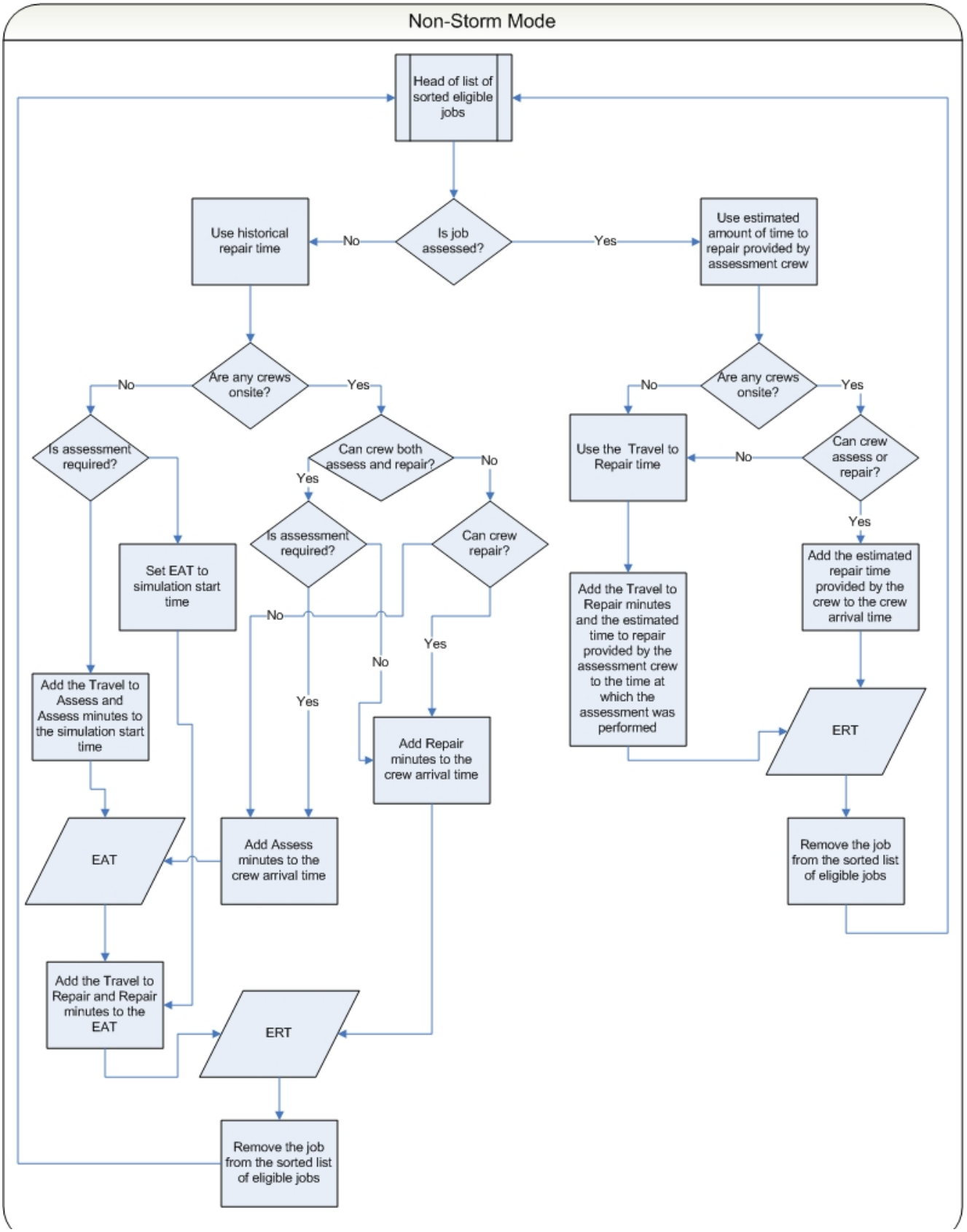
If no assessment has yet been made:

- Verify whether or not a crew is currently onsite for this event.
- If a crew is onsite:
  - Check the crew type to verify whether or not this type of crew is one that can both assess and repair this event.
  - If the crew type cannot perform both tasks:
    - Verify if the crew type can repair this event.
    - If crew can repair:
      - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The historical Repair average is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event.
    - If crew cannot repair:
      - It is assumed that the crew that's onsite is there to perform the assessment. The historical Assess average is added to the time at which the crew arrived onsite to generate the estimated Assessment time (EAT). The historical Travel to Repair and historical Repair averages are added to the estimated Assessment time to generate the estimated restoration time (ERT) for the event.
  - If crew type can perform both tasks:
    - Verify whether or not assessment is required for this event (if Travel to Assess and Assess averages are both 0, assessment is not required).
    - If assessment is not required:
      - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The historical Repair average is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event.
    - If assessment is required:
      - It is assumed that the crew that's onsite is there to perform the assessment. The historical Assess average is added to the time at which the crew arrived onsite to generate the estimated assessment time (EAT). The historical Travel to Repair and historical Repair averages are added to the estimated assessment time to generate the estimated restoration time (ERT) for the event.
- If a crew is not onsite:
  - Verify whether or not assessment is required for this event (if Travel to Assess and Assess averages are both 0, assessment is not required).
  - If assessment is not required:

- No estimated assessment time (EAT) needs to be calculated. This historical Travel to Repair and historical Repair averages are added to the simulation to generate the estimated restoration time (ERT) for the event.

- If assessment is required:
  - The historical Travel to Assess and historical Assess averages are added to the simulation to generate the estimated assessment time (EAT) for the event. The historical Travel to Repair and historical Repair averages are added to the estimated assessment time to generate the estimated restoration time (ERT) for the event.

Non-Storm Mode Algorithm Flow Chart



In summary, for an event that's in a control zone operating under non-storm mode:

- **Estimated assessment time** =
- the time at which the simulation iteration started +
- the historical average number of minutes it takes an assessment crew to arrive onsite +
- the historical average number of minutes it takes a crew to perform assessment once onsite

- **Estimated restoration time** =
- the estimated assessment time +
- the historical average number of minutes it takes a repair crew to arrive onsite +
- the historical average number of minutes it takes a crew to repair once onsite

Exceptions:

If a crew that can perform assessment is already onsite:

Estimated assessment time =

The time at which the assessment crew arrived onsite +

the historical average number of minutes it takes a crew to perform assessment once onsite

If an event has an actual assessment provided and no repair crew is yet onsite:

Estimated restoration time =

The time at which the actual assessment was provided +

the historical average number of minutes it takes a repair crew to arrive onsite +

the actual number of minutes it will take to repair, per the assessment

If an event has an actual assessment provided and a repair crew is already onsite:

Estimated restoration time =

The time at which the repair crew arrived onsite +

the actual number of minutes it will take to repair, per the assessment =

If an event does not require assessment and no repair crew is yet onsite:

Estimated restoration time =

The time at which the simulation iteration started +

the historical average number of minutes it takes a repair crew to arrive onsite +

the historical average number of minutes it takes a crew to repair once onsite

Note: When the historical averages are applied to the calculation, the average that applies to the conditions at the time the particular step is projected to begin is used, not the average that applies to the conditions at the time the simulation iteration began. For example, Shift A has a particular average value for repair, and Shift B has a different average value for repair. The simulation iteration is in Shift A, but the calculated estimated assessment time falls in Shift B. When calculating the

estimated restoration time, the historical average value for repair that pertains to Shift B will be used, not that of Shift A, because the repair isn't projected to begin until sometime during Shift B.

Storm Mode Algorithm

The algorithm for estimate calculation in storm mode is similar to that of non-storm mode, except that in storm mode the data entered into the Crew Information table on the Storm Management window is taken into consideration and used as the known crew resource allocation. At the start of each simulation, the algorithm assembles a crew availability list from the Crew Information table and uses that to keep track of when the next available crews are projected to be ready as the calculation progresses.

For an event that resides in a control zone that is operating under storm mode, the calculation of its estimated assessment and estimated restoration times is as follows:

- Look up the historical average values that pertain to an event with its characteristics
- Verify whether or not an assessment has already been made for the event (if JOBS.ACT_ASSESS_TIME is non-null)

If assessment has been made:

- The repair time assessment provided (JOBS.EST_REPAIR_MINUTES) will be used in the calculation rather than the historical Repair average
- Verify whether or not a crew is currently onsite for this event
- If a crew is onsite:
  - Check the crew type to verify whether or not this type of crew is one that can repair this event
  - If crew can repair:
    - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The actual repair time assessment (JOBS.EST_REPAIR_MINUTES) is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event
  - If crew cannot repair:
    - It is assumed that the onsite crew is there to perform the assessment, and another crew must be sent out to perform the repair. The historical Travel to Repair average and the actual repair time assessment are added to the time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event
- If a crew is not onsite:
  - The historical Travel to Repair average and the actual repair time assessment are added to the time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event. The historical Clean average is added to the ERT and used as the time at which that eligible crew is available to be used for another event in the simulation.

If no assessment has yet been made:

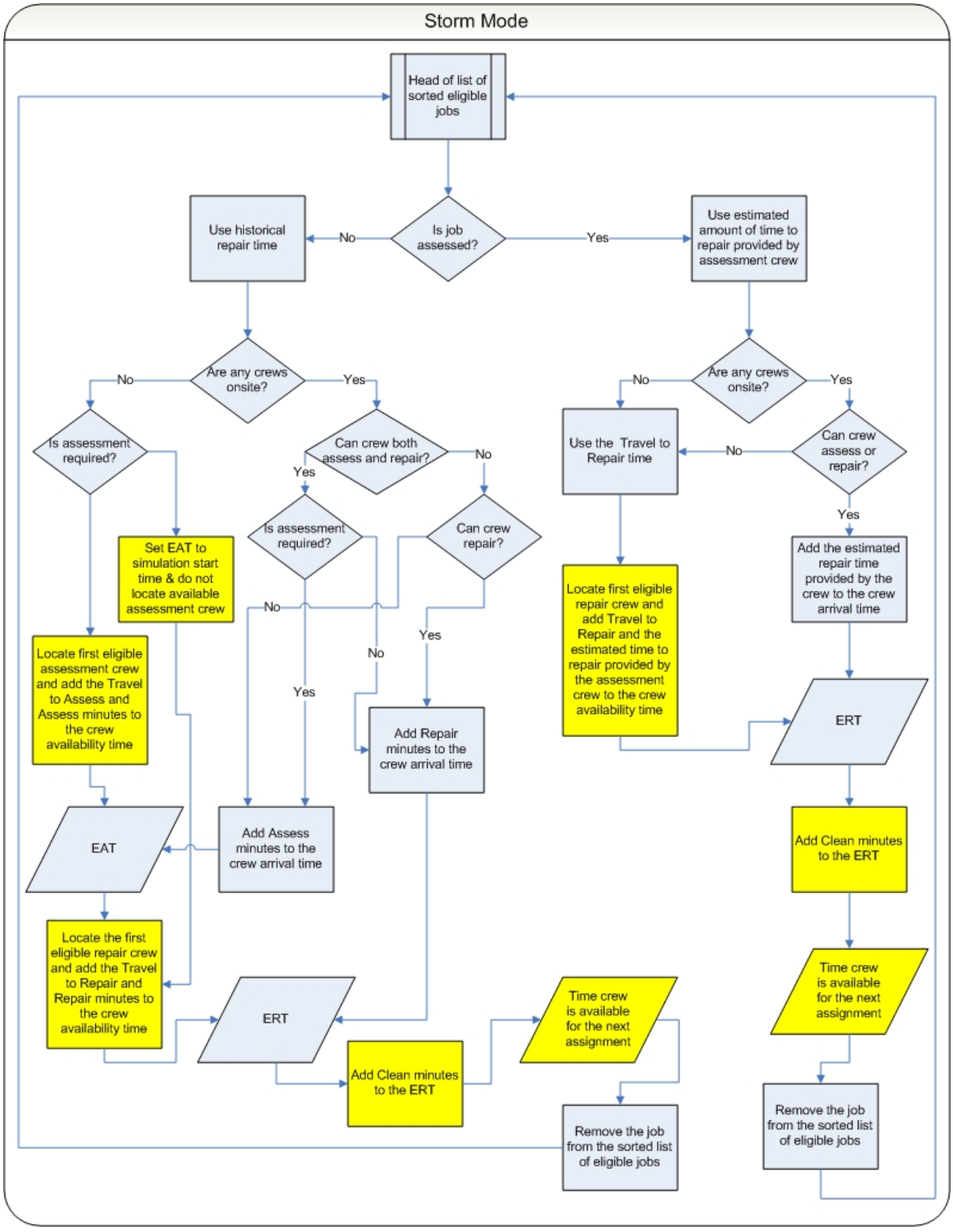
- Verify whether or not a crew is currently onsite for this event
- If a crew is onsite:
  - Check the crew type to verify whether or not this type of crew is one that can both assess and repair this event
  - If the crew type cannot perform both tasks:
    - Verify if the crew type can repair this event
    - If crew can repair:
      - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The historical Repair average is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event
    - If crew cannot repair:
      - It is assumed that the crew that's onsite is there to perform the assessment. The historical Assess average is added to the time at which the crew arrived onsite to generate the estimated assessment time (EAT). The historical Travel to Repair and historical Repair averages are added to the time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event. The historical Clean average is added to the ERT and used as the time at which that eligible crew is available to be used for another event in the simulation.
  - If crew type can perform both tasks:
    - Verify whether or not assessment is required for this event (if Travel to Assess and Assess averages are both 0, assessment is not required)
    - If assessment is not required:
      - It is assumed that the crew that's onsite is there to perform the repair. The historical Travel to Repair average will not be used in the calculation. The historical Repair average is added to the time at which the crew arrived onsite to generate the estimated restoration time (ERT) for the event
    - If assessment is required:
      - It is assumed that the crew that's onsite is there to perform the assessment. The historical Assess average is added to the time at which the crew arrived onsite to generate the estimated assessment time (EAT). The historical Travel to Repair and historical Repair averages are added to time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event
- If a crew is not onsite:
  - Verify whether or not assessment is required for this event (if Travel to Assess and Assess averages are both 0, assessment is not required)
  - If assessment is not required:

- No estimated assessment time (EAT) needs to be calculated. The historical Travel to Repair and historical Repair averages are added to the time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event. The historical Clean average is added to the ERT and used as the time at which that eligible crew is available to be used for another event in the simulation.

- If assessment is required:
  - The historical Travel to Assess and historical Assess averages are added to the time at which the first crew that is eligible to assess this event will become available to generate the estimated assessment time (EAT) for the event. The EAT is used as the time at which that eligible assessment crew is available to be used for another event in the simulation. The historical Travel to Repair and historical Repair averages are added to the time at which the first crew that is eligible to repair this event will become available to generate the estimated restoration time (ERT) for the event. The historical Clean average is added to the ERT and used as the time at which that eligible repair crew is available to be used for another event in the simulation.

Storm Mode Algorithm Flow Chart

The yellow boxes indicate where the storm mode algorithm differs from the non-storm mode algorithm.



In summary, for an event that's in a control zone operating under storm mode:

Estimated assessment time =

- The time at which the first crew that's eligible to assess the event will become available +
- the historical average number of minutes it takes an assessment crew to arrive onsite +
- the historical average number of minutes it takes a crew to perform assessment once onsite

Estimated restoration time =

- The time at which the first crew that's eligible to repair the event will become available after the estimated assessment time +
- the historical average number of minutes it takes a repair crew to arrive onsite +
- the historical average number of minutes it takes a crew to repair once onsite =

Exceptions:

If a crew that can perform assessment is already onsite,

Estimated assessment time =

- The time at which the assessment crew arrived onsite +
- the historical average number of minutes it takes a crew to perform assessment once onsite

If an event has an actual assessment provided and no repair crew is yet onsite:

Estimated restoration time =

- The time at which the first crew that's eligible to repair the event will become available after the actual assessment time +
- the historical average number of minutes it takes a repair crew to arrive onsite +
- the actual number of minutes it will take to repair, per the assessment

Estimated restoration time =

- If an event has an actual assessment provided and a repair crew is already onsite,
- The time at which the repair crew arrived onsite +
- the actual number of minutes it will take to repair, per the assessment

If an event does not require assessment and no repair crew is yet onsite:

Estimated restoration time =

- The time at which the first crew that's eligible to repair the event will become available after the time at which the simulation iteration started +
- the historical average number of minutes it takes a repair crew to arrive onsite +
- the historical average number of minutes it takes a crew to repair once onsite

Notes:

- When the historical averages are applied to the calculation, the average that applies to the conditions at the time the particular step is projected to begin is used, not the average that applies to the conditions at the time the simulation iteration began. For example, Shift A has a particular average value for repair, and Shift B has a different average value for repair. The simulation iteration is in Shift A, but the calculated estimated assessment time falls in Shift B. When calculating the estimated restoration time, the historical average value for repair that pertains to Shift B will be used, not that of Shift A, because the repair isn't projected to begin until sometime during Shift B.
- If the algorithm finds that the calculated estimated assessment time or estimated restoration time would fall beyond the end of the shift of the first eligible crew by more than 60 minutes, it will go back and recalculate the estimate using a different crew other than the one that was originally chosen. The algorithm cannot split work for a single event between multiple shifts of the same crew or between multiple crews. As a consequence, if amount of work required for an event is more than the longest available shift of any crew capable of performing the work then the algorithm will not be able to provide a meaningful ERT for the event. At this point, the algorithm will use "default nominal crew" as a fall back mechanism in order to proceed. This is an artificial crew that can perform any work and not limited by shift restrictions. ERTs generated through use of "default nominal crew" are of no practical value and a warning is written into JMService log file each time this occurs.

Chapter 8

Service Alert Administration

This chapter describes the Oracle Utilities Network Management System - Service Alert Administration application. It covers the following topics:

- Overview
- Using the Service Alert Administration Tool

Overview

Oracle Utilities Network Management System - Service Alert Administration is an application that sends notifications to utility personnel via e-mail or text/SMS message. These notifications are triggered by "events" in Oracle Utilities Network Management System Web Trouble. For example, a notification could be used to alert a marketing staff member that an unplanned outage affects a critical customer. This would enable the marketing person to contact the customer to provide up to date information about the status of the outage. Similarly, an operations staff member could be notified about the outage while away from the office.

Note that Service Alerts for planned events use the Web Switching Management's Impacted Customers list from the corresponding switching sheet to determine which customers would be affected by a planned outage. The Impacted Customers list has to be generated for a switching sheet in order for Service Alert notifications to work. See **Using the Impacted Customers Tab** on page 11-68 for details on the Impacted Customer list.

As a notification engine, Service Alert provides for configurable delivery options through use of an administration tool, and dynamic message format control facilitated by XSL transformation of an XML-based message payload. This gives the administrator the ultimate power and flexibility in determining the routing and content of all notifications.

Using the Service Alert Administration Tool

The **Service Alert Administration Tool** enables you to configure message delivery options. It provides the following features:

- General Features
- Contact Manager
- Group Manager
- Parameter Manager
- Utility Customer Manager
- Attribute Manager

General Features

User Menu

The **User Menu** provides submenus with options to change the appearance and functionality of user interface elements and log out of Service Alert.

User Interface Settings Menu

Menu Option	Description
Theme Selection Radio Buttons • **Dark Theme** • **Light Theme**	Theme selection allows you to choose whether the Web Call Entry uses a **Dark Theme** or a **Light Theme**. • The **Dark Theme** is generally better for low-lit conditions. • The **Light Theme** is generally better for well-lit conditions.
Capitalize Field Labels	If selected, field labels will be displayed in All Caps (for example, **NAME**). If not selected, field labels will be displayed in title case (for example, **Name**).
Toggle Accessible Mode	Changes settings to enable use with screen readers. Note: There are prerequisites to enabling accessible mode. Please see Appendix A-Accessibility Features for information on enabling **Accessible** mode.
Show Messages at Mouse Location	Sets the system to display popup confirmation and warning dialog boxes at your mouse pointer position.
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Darken Watermarks	Make the watermarks more opaque.
Lighten Watermarks	Make the watermarks more transparent.
Show Watermarks	Allows you to toggle watermarks on or off.

Table Settings Menu

The Table Settings submenu allows you to configure how tables will appear.

Menu Option	Description
Alternate Row Coloring	When selected, displays data table rows in alternating colors.
Capitalize Column Headings	Allows you to select whether column labels should be displayed in all capital letters (for example, **STATUS**) or in title case (for example, **Status**)
Table Color Formatting Mode	Determines whether and how tables will display background coloring. **Options** • **None:** Tables will not contain color indicators for statuses. • **Cells:** Table cells will contain background colors based on the cell statuses. • **Row:** All cells in a table row will have the background color.
Table Font Formatting Mode	Determines whether and how tables will display font formatting. **Options** • **None:** Conditional formatting related to font formatting are never shown. • **Cells:** Conditional formatting related to font formatting are applied only to the cells they were configured for. • **Row:** Conditional formatting related to font formatting are applied across the whole row. Where more than one formatting rule is applied, the highest priority rule is displayed.

Manage Preferences Menu

Menu Option	Description
Save Preferences	Saves your preferences to the database so your settings are available wherever you log in. **Note:** Theme selection is saved to your user settings on the workstation since they are more likely influenced by the light in a location.
Restore Preferences	Opens a dialog box that allows you to select the preferences to restore.
Manage Site-wide Settings	**Options** • **Update Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may log in as a different user type, configure, and save the default preferences for all users of the log in type. • **Restore Site-wide Preferences:** Users who have Administration permissions (having access to the Configuration Assistant) may restore the default preferences for the logged in user type to the original configuration.

User Logout: Logs you out of the system and shuts down the client.

Help Menu

The options in the Help menu are available at all times. The following table describes the **Help** menu options.

Option	Description
Service Alert Help	Opens the Online Help content for Service Alert.
Email Log Files...	Gathers the environment²'s log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Service Alert	Opens a dialog box that displays information regarding what version of the application is presently running, as well as version and other information about the Oracle Utilities Network Management System Web Gateway that the application is using.

Contact Manager

The Contact Manager tab allows you to perform the following tasks:

- Adding a Contact
- Editing a Contact
- Removing a Contact

For a description of the fields and buttons on this tab, see the following topic.

Contact Manager Tab

The Contact Manager tab is used to add, edit, or remove contact information. The contact information contains identification information to associate each entry with an individual, as well as details regarding contacting the individual when a notification occurs. Note that an individual may have many contact entries. All contact entries in the system are listed in the Contacts table. Disabled contacts cannot receive notifications.

The Contact Manager tab displays the following fields and buttons:

- The **Contacts** pane lists company contacts that have been added through the Contact Manager. The table row colors correspond to whether a contact is active (white) or inactive (bluish gray). Rows in the table can be sorted in ascending or descending order by clicking on any column header.

  The columns displayed are user selectable by right-clicking the table heading area and select or deselect the list of available columns in the **Select Columns to Display** dialog box. Once the columns have been chosen, you may save the choices for your subsequent sessions by selecting **Save Preferences** from the **Preferences** menu; if not saved, the default columns will be displayed when you log in again. See **Manage Preferences Menu** on page 8-5 for details on saving and restoring column selections.

  The default product configuration displays the following columns:

  - The **Contact ID** column contains the contact's identification number.
  - The **Name** column contains the contact's name.
  - The **Email** column contains the contact's email address.
  - The **Active** columns contains the **Y** or **N** Active status.
  - The **Email** column contains the contact's email address.
  - The **Text/SMS** column contains the contact's SMS number.
  - The **Script** column contains the script identifier used to deliver notifications to the contact.
  - The **Add** button ( ) activates the editable fields in the Contact Information pane, which allows you to add a new contact.
  - The **Edit** button ( ) allows the user to edit contact information for the contact selected in the Contacts table.
  - The **Remove** button ( ) removes the currently selected contact parameter from the system.

- The **Print** button ( ) opens the Print Preview window that allows you to print the contact list.

- The **Contact Information** pane is where the details for a contact are entered and/or edited.
  - The **Name** field contains the contact's name. This field can be edited when in add/edit mode. For sorting purposes, it is recommended that names be entered in "Last name, First Name" type format.
  - The **Contact ID** field contains a unique identifier that is useful for identifying an individual, particularly when that individual has more than one contact entry. Sorting on the External ID allows for quick viewing of all an individual's contact entries. A work phone number (possibly concatenated with a phone extension) could be used, for example.
  - The **Current Groups** field contains the groups to which this contact belongs. This field is not editable by the user, although group memberships can be modified on the Group Manager pane.
  - The **Email** field contains the contact's email address. This field can be edited when in add/edit mode.
  - The **Text/SMS** field contains the contact's SMS number. This field can be edited when in add/edit mode. This value will be the email alias for the contact's SMS device. The button next to the field allows the user to browse for a text messaging provider to assist in constructing the SMS device address string.
  - The **Search** button ( ) opens the Select Text Message Provider dialog box. This dialog box provides a convenient means for select a text messaging provider used in constructing the email alias for an SMS device.
  - The **Script** drop-down list allows you to select a script that is used to deliver notifications to the contact.
  - The **Active** check box enables/disables the contact entry. Disabled contacts do not receive notifications.

- The **Save** button ( ) saves the contact information currently being added/ edited to the database.

- The **Cancel** button ( ) cancels the current add/edit operation.

Adding a Contact

To add a contact, complete these steps:

1. Click the **Contact Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The appropriate fields in the Contact Information section become enabled.
3. Fill in the following fields: **Name**, **Contact ID**, **Email** (optional), **Text/SMS** (optional), **Script** (optional), and **Active**. The **Save** button becomes enabled.
4. If necessary, select a text messaging provider. See the next section for instructions regarding selecting a text messaging provider.
5. Click the **Save** button to save the contact information.

   Note: At least one of the following fields needs to be populated: **Email**, **Text/SMS**, and/or **Script**.

Editing a Contact

To edit a contact, complete these steps:

1. Click the **Contact Manager** tab on the Service Alert Administration Tool.
2. Click on a row in the **Contacts** table. This row represents the contact to be edited.
3. Click the **Edit** button. The appropriate fields become enabled.
4. Modify one or more of the following fields: **Name**, **Contact ID**, **Email**, **Text/SMS**, and **Active**.
5. If necessary, select a text messaging provider. See **Selecting a Text Messaging Provider** on page 8-8 for instructions regarding selecting a text messaging provider.
6. Click the **Save** button to save the contact information.

   Note: At least one of the following fields needs to be populated: **Email**, **Text/SMS**, and/or **Script**.

Selecting a Text Messaging Provider

To select a text messaging provider, complete these steps:

1. Click on the **Search** icon next to the **Text/SMS** field. The Select a Text Messaging Provider dialog box appears.
2. Click on a row in Text Message **Providers** table. This row represents the text messaging provider to be chosen. The Text Message Providers table contains the following columns:
   - **Provider** – The name of the text messaging provider company.
   - **Prefix** – A description of how an email alias for the SMS device is constructed. Typically, a sample prefix will be concatenated with the domain name.
   - **Domain Name** – The domain name used to construct the email alias for the SMS device.
3. Click **OK** to choose the selected text messaging provider, or **Cancel** to dismiss the dialog box without selecting a provider. The Select Text Message Provider dialog box closes.
4. Edit the **Text/SMS** field as appropriate.

Note: The text messaging provider table is populated during the system installation. If you need to add, edit, or modify text messaging provider information, then contact your system administrator.

Removing a Contact

To remove a contact, complete these steps:

1. Click the **Contact Manager** tab on the Service Alert Administration Tool.
2. Click on a row in the **Contacts** table. This row represents the contact to be removed.
3. Click the **Remove** button. The Remove Contact dialog box opens.
4. Click **Yes** to remove the contact from the system, or **No** to avoid removing the contact from the system.

Group Manager

The Group Manager tab on the Service Alert Administration Tool window is used to add, edit or remove contact groups, as well as specify the notification format for a group based on each notification type. A group is used in defining notification parameters. A notification parameter is the definition of a rule used to trigger a notification. Every parameter requires a group of contacts to be specified. This group specifies the intended recipients of a notification.

From the Group Manager tab, you can perform the following tasks:

- Adding a Group
- Removing a Group
- Adding a Contact to a Group
- Removing a Contact from a Group
- Modifying the Message Transformation File

For a description of the fields and buttons on this tab, see the following topic.

Group Manager Tab

The Group Manager tab contains the following information:

- The **Groups** pane displays a list of all groups in the system. A group does not need to contain any contacts, nor does it need to be associated with a notification parameter.
  - The **Add** button on the Groups pane opens the **Add Group** dialog box. This dialog box allows a new, empty group to be created. Each group must have a unique name.
  - The **Remove** button on the Groups pane deletes the group from the database. This will also delete all parameters associated with the group, but contacts that are members of the group are not deleted.
- The **Contacts** pane displays a list of the individual members in the selected group.
  - The **Add** button on the Contacts pane opens the **Add Contact** dialog box. This dialog box allows contacts to be added to the selected group.

    - The **Remove** button on the Contacts pane removes the selected contact from the selected group.
- The **Message Types** pane displays a list of the available notification message types that the selected group can receive.
- The **Message Formats** pane contains information regarding the transforms for the selected message type.
    - The **Email** field displays the transform, in the form of an XSL file, that will be applied to the notifications of the selected notification type bound for an email destination corresponding to members of the selected group.
    - The **Text/SMS** field displays the transform, in the form of an XSL file, that will be applied to the notifications of the selected notification type bound for a Text/SMS destination corresponding to members of the selected group.
    - The **Script** field displays the transform, in the form of an XSL file, that will be applied to the notifications of the selected notification type bound for a script destination corresponding to members of the selected group. Leaving the **Script** field empty would cause raw XML to be delivered to the script.
- The **Modify Transformation** button saves the XSL file information to the database for the selected group and notification type.

  Note: You must verify that the specified XSL file is available in the designated location.

Adding a Group

To add a group, complete these steps:

1. Click the **Group Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The Add Group dialog box opens.
3. Enter a group name in the Group Name text field.
4. Click **OK** to create a group, or **Cancel** to avoid creating the group.

Removing a Group

To remove a group, complete these steps:

1. Click the **Group Manager** tab on the Service Alert Administration Tool.
2. Click on a group on the **Groups** list. The highlighted group is the group to be removed.
3. Click the **Remove** button. A confirmation dialog box opens.
4. Click **Yes** to remove the group, or **No** to avoid removing the group.

Adding a Contact to a Group

To add a contact to a group, complete these steps:

1. Click the **Group Manager** tab on the Service Alert Administration Tool.
2. Click on a group on the **Groups** list. The highlighted group is the group to which a contact will be added.

3. Click on the **Add** button. The Select Contact dialog box opens. The Contacts table in the Select Contact dialog box displays all the contacts in the system that do not belong to the selected group.
4. Click on a row in the Contacts table. The Contacts table contains the following columns:
    - **ID** – System assigned unique id for the contact.
    - **External ID** – A unique identifier that is useful for identifying an individual, particularly when that individual has more than one contact entry. Sorting on the External ID allows for quick viewing of all an individual's contact entries, for example, Employee ID.
    - **Name** – The contact's name.
    - **Email** – The contact's email address.
    - **Text/SMS** – The contact's SMS device address.
    - **Active** – A flag to indicate whether or not the contact is enabled in the system. Disabled contacts cannot receive notifications. Note that the table row colors correspond to whether a contact is active (white) or inactive (light blue).
5. Click **OK** to add the selected contact to the group, or **Cancel** to avoid adding the contact to the group.

Removing a Contact from a Group

To remove a contact from a group, complete these steps:

1. Click the **Group Manager** tab on the Service Alert Administration Tool.
2. Click on a group on the **Groups** list. The highlighted group is the group from which a contact will be removed. The Contacts list displays the contacts in the selected group.
3. Click on a contact on the **Contacts** list. This is the contact to be removed.
4. Click the **Remove** button. The Remove Contact From Group dialog box opens.
5. Click **Yes** to remove the contact from the group, or **No** to avoid removing the contact from the group.

Modifying the Message Transformation File

To modify the transform for a given group and notification type, complete these steps:

1. Click the **Group Manager** tab.
2. Select a group in the **Groups** list. The transformation filename will be modified for the selected group.
3. Click on a notification type in the **Message Type** list. The highlighted type will be the notification type for which the transformation filename will be modified. The Email, Text/SMS, and Script transformation filename fields display default values for each transformation.

    Note: The available Message Formats are configured in the publisher_transformations table, which is populated by the `nms_core_publisher.sql` file.

4. Modify the filenames associated with each transform.
5. Click **Modify Transformation** to save the filenames to the database.

Parameter Manager

The Parameter Manager tab is used to add, edit, or remove notification triggering parameter information. A notification triggering parameter is the rule for defining a notification trigger within Service Alert. A parameter consists of a name, a threshold value, a group to notify when a violation occurs, and an associated control zone, device, or customer. Inactive parameters cannot be violated, and therefore will never trigger a notification.

The Parameter Manager tab allows you to perform the following tasks:

- Adding a Customer Count Parameter
- Adding a Specific Customer Parameter
- Adding a Frequency of Outages Parameter
- Adding a Storm Affecting Control Zone Parameter
- Editing a Parameter
- Removing a Parameter

For a description of the fields and buttons on this tab, see the following topic.

Parameter Manager Tab

The Parameter Manager tab is contains two panes:

- Parameters Pane
- Parameter Information Pane

Parameters Pane

The Parameters pane displays the following fields and buttons:

- The **Parameters** pane lists all parameters in the system. Note that the table row colors correspond to whether a parameter is active (white) or inactive (bluish gray). For convenience, the rows in the table can be sorted in ascending or descending order by clicking on any column header.

  The columns displayed are user selectable by right-clicking the table heading area and selecting or deselecting the list of available columns in the **Select Columns to Display** dialog box. Once the columns have been chosen, you may save the choices for your subsequent sessions by selecting **Save Preferences** from the **Preferences** menu; if not saved, the default columns will be displayed when you log in again. See **Manage Preferences Menu** on page 8-5 for details on saving and restoring column selections.

  The default product configuration displays the following columns:

  - The **Name** column contains a descriptive name given to the parameter.
  - The **Type** column contains the notification type on which the parameter is based.

- The **Value** column contains the threshold value used in determining if a parameter violation has occurred. The units for this value are based on the notification type. For example, the parameter value unit of for the "Outage" notification type is "number of customers out." The "Outage affecting critical customer(s)" notification parameter value unit is "number of critical customers out."
- The **Contact Groups** column contains the group of contacts to be notified when a parameter violation occurs.
- The **Control Zones** column contains the control zones to which the parameter applies.
- The **Device Class(es)** column contains the types of devices to which the parameter applies, if applicable.
- The **# Devices** column contains the number of device aliases associated with the parameter, if applicable.

Note: A parameter must specify either a control zone or a list of devices, but not both.

- The **# Accounts** column contains the count of customer account numbers associated with the parameter, if applicable.
- The **Duration** column contains the time interval associated with the parameter, if applicable. This is the minimum outage duration (in seconds) before the notification is triggered.
- The **Max ERT Notifications** column contains the maximum number of notifications that will be delivered when there are ERT updates.
- The **Event Types** column contains the names of the specific event types this notification will be triggered for.
- The **Event States** column contains the names of the specific event states that this notification will be triggered for. (Currently only used for Specific customer affected by unplanned outage notification.)
- The **Use Event States** column contains a flag to indicate whether the Event State trigger is active for the parameter.
- The **Customer Types** column contains the critical customer types used in calculations for the associated notification.
- The **Crew Types** column contains the names of the specific crew types the notification will be triggered for; this only applies when **Crew Action** trigger is selected.
- The **Crew States** column contains the names of the specific crew states (**Assigned**, **En-Route**, **Onsite**, **Suspended**) the notification will be triggered for; this only applies when **Crew Action** trigger is selected.
- The **Planned** column displays Y if notification should only be triggered for planned events.
- The **Disable During Storm** column contains a flag to indicate whether parameter violation should be suppressed when the associated control zone is in storm mode or the associated device resides in a control zone that is in storm mode. Storm modes are defined as part of Web Trouble configuration (rule sets applied to a control zone in the Authority tool).

- The **Duration** column contains the minimum outage duration (in hh:mm:ss format) required for the outage to trigger a notification.

- The **Add** button activates the editable fields in the Parameter Information pane, which allows you to add a new parameter.
- The **Edit** button allows you to edit the currently selected parameter.
- The **Remove** button removes the currently selected parameter from the system.
- The **Export Table** button allows you to save the Parameter Information table data as a CSV file.

Parameter Information Pane

The Parameter Information pane is where the details for a parameter are entered and/or edited. The Parameter Information pane displays the following fields and buttons:

Note: The fields and buttons on this pane vary depending on the type of notification.

- The **Name** field displays the descriptive name given to the parameter. This value can be modified be when in add/edit mode.
- The **Select Contact Groups...** button brings up the Select Contact Groups dialog box for selecting one or more groups to be notified when the parameter is violated. You can use the Control key in conjunction with the left mouse button to make multiple selections or deselect a group in the Select Contact Groups dialog box. This button is enabled when in add/edit mode.
- The **Type** field displays a list of enumerated notification types to which this parameter applies. This value can be selected when in add/edit mode.
  - Outage
  - Outage Affecting Critical Customer(s)
  - Outage Affecting Specific Customer(s)
  - Frequency of Outages on a Device
  - Storm Affecting Control Zone
- The **Value** field displays the parameter threshold value. This value can be modified when in add/edit mode.
- The **Number of Selected Accounts** field displays the number of customer account numbers associated with the parameter, if applicable. This field is not editable.
- The **Select Accounts...** button displays the Select Accounts dialog box, allowing you to search for customer accounts to associate with the parameter, if applicable.
- The Event Type radio group allows you to select whether notification should be triggered by Planned or Unplanned events. This is only displayed for outage-type notifications.
  - The **Select Event Types...** button opens the Select Event Types dialog box that allows you to select one or more event types that will trigger the notification when the parameter is violated. When multiple event types are selected, a notification will only be triggered the first time one of the

selected event types is met. This button is enabled in add/edit mode when Unplanned Event Type is selected.

- The Trigger group allows you to select the event status that will trigger the notification. This group may contain one or more of the following options:
  - Scheduled - This check box is enabled only for outage notifications where the Event Type is Planned. If this is checked, the system will generate a notification when a switching sheet reaches the scheduled state, provided that other notification conditions are met.
  - Started/In-Progress - This check box is enabled only for outage notifications. If this is checked, the system will generate a notification when a planned or unplanned outage is started, provided that other notification conditions are met.
  - Restored - This check box is enabled only for outage notifications. If this is checked, the system will generate a notification when a planned or unplanned outage is restored, provided that other notification conditions are met.
  - Canceled - This check box is enabled only for outage notifications. If this is checked, the system will generate a notification when a switching sheet reaches canceled state or when an unplanned outage is canceled, provided that other notification conditions are met.
  - ERT Updated - If checked, the system will generate a notification when an ERT is manually updated for an outage, provided that other notification conditions are met.
  - **Crew Action** - This check box is enabled only for outage notifications. If selected, the system will generate a notification when the specified crew type and crew state are met provided that other notification conditions are also met. The notification will be triggered only the first time an event has been observed to be in a particular crew state (for example, if a parameter specifies crew types of **Service** and Trouble and the crew state is **Assigned**, notification for a particular event will be generated only the first time a Service or Trouble crew is assigned to the event).
  - **Storm Started** - This check box is enabled only if the notification type is Storm Affecting Control Zone. If this is checked, the system will generate notification when storm has been created in Storm Management tool.
  - **Storm Updated** - This check box is enabled only if the notification type is Storm Affecting Control Zone and Storm Started check box is checked. If this is checked, the system will generate notification when information for an existing storm has been updated in Storm Management tool.
  - **Storm Ended** - This check box is enabled only if the notification type is Storm Affecting Control Zone. If this is checked, the system will generate notification when storm has been marked as ended in Storm Management tool.
- The **Select Crew Types...** button displays the **Select Crew Types** dialog box, allowing you to select crew types to associate with the parameter; this is only available when **Crew Action** trigger is selected.
- The **Select Crew States...** button displays the **Select Crew States** dialog box, allowing you to select crew states to associate with the parameter; this is only available when Crew Action trigger is selected.

- The **Duration** field allows you to enter the minimum outage duration (in hh:mm:ss format) required to trigger a notification. If an outage meets all the conditions for notification, but does not have sufficient duration, the system will delay the notification until the required outage duration has been reached. Duration of 0 seconds means that notification should be generated regardless of the outage duration. This field is only available for notification types: Outage, Outage Affecting Critical Customers, and Outage Affecting Specific Customers. Duration check is not applicable to Master Switching Jobs.
- The **Max ERT Notifications** field allows you to enter the maximum number of ERT updated notifications to be triggered for an event.

  Notes:

  - The **Max ERT Notifications** field is only visible when **Outage**, **Outage affecting critical customers**, or **Outage affecting specific customer types** are selected.
  - It is editable only when **ERT Updated** is selected in the Trigger pane.
  - By default, it is populated with the *ertMaxUpdates* SRS rule (see **Using the Event Management Rules Tab** on page 24-16 for details on configuring SRS rules).
- The **Number of Selected Devices** field displays the number of device aliases associated with the parameter, if applicable. This is non-editable field.
- The **Select Devices...** button displays the Select **Devices** dialog box, allowing you to search for devices to associate with the parameter, if applicable.
- The **Device Class(es)** field displays the classes or types of devices to which the parameter applies. This value can be modified when in add/edit mode, depending upon the type of notification selected.
  - The **Select Device Classes...** button displays the Select Device Classes dialog box, allowing you to select device types to associate with the parameter, if applicable.
  - The **Clear** button clears the **Device Class(es)** field.
- The **Control Zones** field displays the control zones of the device to which the parameter applies. This value can be modified when in add/edit mode.
  - The **Select Control Zones...** button displays the Select Control Zones dialog box, allowing you to associate the parameter with a control zone, if applicable.
  - The **Clear** button clears the Control Zones field.

  Note: A parameter must specify either control zone or a device, but not both.
- Click the Use Event States check box if you want to select specific event states that will trigger the notification when the parameter is violated. If checked, the Select Event States... button is enabled.
  - The **Select Event States...** button brings up the Select Event States dialog box for selecting one or more event states. You can use the Control key in conjunction with the left mouse button to make multiple selections or

deselect a group in the Select Event Types dialog box. This button is enabled when in add/edit mode.

- The **Time Interval** field displays the time interval value associated with the parameter. This value can be modified when in add/edit mode, depending upon the type of notification selected.
  - The **Specify Time Interval** button displays the Specify Time Interval dialog box, allowing you to specify what time interval should be used for the parameter, if applicable.
  - The **Clear** button to the right of the Specify Time Interval button clears the Time Interval field when pressed.
- The **Disable During Storm** check box allows you to enable/disable the parameter during storm mode.
- The **Active** check box allows you to enable/disable the parameter.
- The **Select Customer Types...** button allows you to select one or more customer types to be considered in the calculations for the notification. This button is displayed only for notifications that involve critical customers.

  When you click this button, the Select Customer Type dialog box opens. Select the customer types to include, then click **OK**.

  Note: If a customer belongs to more than one of the selected customer types, the customer is only counted once in the calculation.
- The **Save** button saves the parameter information.
- The **Cancel** button cancels an add/edit parameter operation.

About Parameter Values

A parameter must have certain required data specified before it may be saved. A parameter consists of a name, a threshold value, a group to notify when a violation occurs, and an associated control zone, device, or customer. The parameter value has a different meaning in the context of each of the various notification types.

The following table gives the units for each notification type.

Notification Type	Parameter Value Unit
Outage	Number of customers affected
Outage affecting critical customers	Number of critical customers affected
Outage affecting specific customer	N/A
Frequency of outages on a device	Number of outages
Storm affecting control zone	N/A

Note: A group must exist to save the parameter. Use the Group Manager tab to create a group if one does not already exist.

Different notification types have different additional data required. The following table lists the other required values for each notification type.

Notification Type	Other Required Information
Outage	Event Type, Trigger, at least one device alias or Control Zone, or Device Class and Control Zone
Outage affecting critical customers	Event Type, Trigger, at least one device alias or Control Zone, or Device Class and Control Zone.
Outage affecting specific customer	Event Type, Trigger, at least one customer account number.
Frequency of outages on a device	Time Interval, at least one device alias, or Device Class and Control Zone
Storm affecting control zone	Trigger, Control Zone

Adding a Customer Count Parameter

To add either an Outage notification parameter or an Outage affecting critical customers notification parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The appropriate fields on the Parameter Information pane become enabled.
3. Enter a descriptive name for the parameter into the **Name** field.
4. Click the **Select Contact Groups...** button. The Select Contact Groups dialog box appears.
5. Select one or more groups to be notified when the parameter is violated from the Select Contact Groups dialog box.
6. Click the **OK** button on the Select Contact Groups dialog box. The Select Contact Groups dialog box disappears.
7. Select either "1. Outage" or "2. Outage affecting critical customer(s)" from the **Type** context menu.
8. In the **Value** field, enter a number that represents the number of customers that must be out in order to trigger the notification.
9. Select either Unplanned or Planned from the **Event Type** options.
10. To limit the types of events that can trigger the notification, click the **Select Event Types...** button, then make your selection in the Select Event Types dialog box. If no selection is made, then the notification is triggered by all event types.
11. Select one or more check boxes in the **Trigger** section to specify when this notification should be triggered.
12. Either specify a list of devices or list of device classes and a list of control zones for the parameter. This is used in conjunction with the Value in order to trigger the notification.

a. To specify a device, do the following:

- Click the **Select Devices...** button. The Select Devices dialog box opens.
- Click the **Add** button to open the Device Search dialog box. Enter your search criteria into the Search Text field.
- Click the **Search** button. The search results are displayed in the table.
- Select the desired devices from the table and click **OK**. The Select Devices dialog box is populated with rows for each selected device.
  - Newly added rows have a green background.
  - Rows can be removed from the Select Devices dialog box using the **Remove Device** button. Rows scheduled for removal have a red background.
  - The **Undo Changes** button reverts all changes made to the list of devices in the Select Devices dialog box.
- Click **OK** to close the Select Devices dialog box. The Number of Selected Devices will be updated with the count of selected devices.

b. To specify device classes and control zones, do the following:

- Select Device Classes
  - Click the **Select Device Classes...** button. The Select Device Classes dialog box opens.
  - Select the device classes in the tree pane. You may click Expand All to show all device classes in the tree and click **OK**. The Select Device Classes dialog box will close and the Device Class(es) field will be populated with the selected device class names.
- Select Control Zones
  - Click the **Select Control Zones...** button. The Select Control Zones dialog box opens.
  - Select the desired control zones from the tree, and click **OK**. The Select Control Zones dialog box will close and the Control Zones field will be populated with the name of the selected control zones.

13. Select/deselect the **Use Event States**, **Disable During Storm, and Active** check boxes, as desired.
14. If the **Crew Action** trigger is selected, use the **Select Crew Types...** and **Select Crew States...** buttons to select the crew types and crew states that can trigger the notification.
15. Click the **Save** button to save the parameter.

Adding a Specific Customer Parameter

To add an Outage affecting a specific customer parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The appropriate fields on the Parameter Information pane become enabled.

3. Enter a descriptive name for the parameter into the **Name** field.
4. Click the **Select Contact Groups...** button. The Select Contact Groups dialog box appears.
5. Select one or more groups to be notified when the parameter is violated from the **Select Contact Groups** dialog box and click **OK**. The Select Contact Groups dialog box disappears.
6. Select "3. Outage affecting specific customer notification" from the **Type** drop-down list.
7. Select either Unplanned or Planned from the **Event Type** radio group.
8. To limit the types of events that can trigger the notification, click the **Select Event Types...** button, then make your selection in the Select Event Types dialog box. If no selection is made, then the notification is triggered by all event types.
9. Select one or more check boxes in the **Trigger** section to specify when this notification should be triggered.
10. Click the **Select Accounts...** button to bring up the Select Accounts dialog box.
11. Click the **Add Account** button to bring up the Account Search dialog box.
12. Select a search criterion on the **Search Parameter** drop-down list.
13. Enter text into the **Search Text** field according to the search criterion selected in the previous step.
14. Click the **Search** button. The search results are displayed in the table.
15. Select the desired accounts from the table and click **OK**. The Account Search dialog box disappears and rows for the selected account numbers are added to the Select Accounts dialog box.
    - Newly added rows have a green background.
    - Rows can be removed from the Select Accounts dialog box using the **Remove Account** button. Rows scheduled for removal have a red background.
    - The **Undo Changes** button reverts all changes made to the list of account in the Select Accounts dialog box.

    Once satisfied with the list of accounts click **OK**. The Select Accounts dialog box disappears, and the Number of Selected Accounts field is populated with the number of distinct account numbers from the Select Accounts dialog box.
16. Select/deselect the **Use Event States**, **Disable During Storm, and Active** check boxes as desired.
17. If the **Crew Action** trigger is selected, use the **Select Crew Types...** and **Select Crew States...** buttons to select the crew types and crew states that can trigger the notification.
18. Click the **Save** button to save the parameter.

Adding a Frequency of Outages Parameter

To add a Frequency of Outages on a Device Notification parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.

2. Click the **Add** button. The appropriate fields on the Parameter Information pane become enabled.
3. Enter a descriptive name for the parameter into the **Name** field.
4. Click the **Select Contact Groups...** button. The Select Contact Groups dialog box appears.
5. Select one or more groups to be notified when the parameter is violated from the **Select Contact Groups** dialog box.
6. Click the **OK** button on the Select Contact Groups dialog box. The Select Contact Groups dialog box disappears.
7. Select "5. Frequency of outages on a device notification" from the **Type** drop-down list.
8. Enter a number in the **Value** field that represents the number of outages there must be in order to trigger the notification.
9. If desired, click the **Select Event Types...** button to bring up the Select Event Types dialog box to limit the types of events that can trigger the notification. If no selection is made, then the default is all event types.
10. Click the **Specify Time Interval** button to bring up the Specify Time Interval dialog box. Specify a time interval either as a certain number of hours/days/weeks/years.

    To specify the time interval as having a specific begin date, complete these steps:

    - Select the **Begin Date** radio button on the Specify Time Interval dialog box. The Calendar button becomes enabled.
    - Click on the **Calendar** button. The Calendar dialog box appears.
    - Specify the desired begin date and time in the Calendar dialog box, then press the **OK** button. The Calendar dialog box disappears, and the selected date/time now appears in the field next to the Begin Date radio button.

    To specify the time interval as a certain number of hours/days/weeks/years, complete these steps:

    - Select the **Time Window** radio button. The text field and drop-down list become enabled.
    - Select the desired unit of time from the drop-down list and enter the desired number of units into the text field.
    - Click the **OK** button on the Specify Time Interval dialog box. The Specify Time Interval dialog box disappears, and the Time Interval field is populated with the interval that was specified.
11. Either specify a list of devices or a list of device classes and list of control zones for the parameter. These are used in conjunction with the Value and Time Interval in order to trigger the notification.

    To specify a list of devices, do the following:

    - Click the **Select Devices...** button. The Select Devices dialog box opens.
    - Click the Add button to open the Device Search dialog box. Enter your search criteria into the Search Text field.
    - Click the **Search** button. The search results are displayed in the table.
    - Select the desired devices from the table and click **OK**. The Select Devices dialog box is populated with rows for each selected device.

- Newly added rows have a green background.
- Rows can be removed from the Select Devices dialog box using the **Remove Device** button. Rows scheduled for removal have a red background.
- The **Undo Changes** button reverts all changes made to the list of devices in the Select Devices dialog box.

- Click **OK** to close the Select Devices dialog box. The Number of Selected Devices will be updated with the count of selected devices.

To specify a list of devices classes and a list of control zones, complete these steps:

- Click the **Select Device Classes...** button. The Select Device Class dialog box appears.
- Select the desired device classes from the tree and click **OK**. The Select Device Classes dialog box disappears, and the Device Class(es) field is populated with the names of the device classes.
- To specify a list of control zones, click the **Select Control Zones...** button. The Select Control Zones dialog box appears.
- Select the list of control zones from the tree, and click **OK**. The Select Control Zones dialog box disappears, and the Control Zones field is populated with the name of the selected control zones.

12. Select/deselect the **Use Event States**, **Disable During Storm, and Active** check boxes as desired.
13. Click the **Save** button to save the parameter.

Adding a Storm Affecting Control Zone Parameter

To add a Storm Affecting Control Zone parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The appropriate fields on the Parameter Information pane become enabled.
3. Enter a descriptive name for the parameter into the **Name** field.
4. Click the **Select Contact Groups...** button. The Select Contact Groups dialog box appears.
5. Select one or more groups to be notified when the parameter is violated from the **Select Contact Groups** dialog box.
6. Click the **OK** button on the Select Contact Groups dialog box. The Select Contact Groups dialog box disappears.
7. Select "6. Storm affecting control zone" from the Type drop-down list.
8. Check **Storm Started** and/or **Storm Ended** in the **Trigger**. If Storm Started is checked, Storm Updated will become available and can also be checked.
9. Click the **Select Control Zones...** button. The **Select Control Zone** dialog box appears.
10. Choose the desired control zones for the alert and click **OK**. The **Control Zones** field will be populated with your choice.
11. Click the **Save** button to save the parameter.

Editing a Parameter

To edit a parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.
2. Click on one of the existing parameters in the Parameters table. The **Edit** button becomes enabled.
3. Click the **Edit** button. The appropriate fields will become enabled.
4. Edit each field as desired.
5. Click **Save** to save the edited information, or click **Cancel** to avoid saving the edited information.

Removing a Parameter

To remove a parameter, complete these steps:

1. Click the **Parameter Manager** tab on the Service Alert Administration Tool.
2. Click on one of the existing parameters in the Parameters table. The **Remove** button becomes enabled.
3. Click the **Remove** button. The Remove Parameter dialog box opens.
4. Click **Yes** to remove the parameter or **No** to avoid removing the parameter.

Utility Customer Manager

The Utility Customers tab is used for designating customers as being "critical" within Service Alert and entering contact information for each critical customer. This information will display in the "Outage affecting critical customer(s)" notification. To "import" a customer into Service Alert, an "add" operation must be performed. Once the customer has been added, customer contacts can be associated with the account. Each customer contact can also have one or more phone entries, which indicate how the customer contact can be reached. To bring up contact information for an existing Service Alert Critical account, a "search" must be performed.

The Utility Customers tab allows you to perform the following tasks:

- Adding an Account to Service Alert
- Searching for an Account
- Editing an Account
- Removing an Account
- Editing Customer Device Information
- Adding Customer Contact Information
- Searching for a Customer Contact
- Editing Customer Contact Information
- Removing Customer Contact Information
- Adding Customer Contact Phone Information
- Editing Customer Contact Phone Information
- Removing Customer Contact Phone Information

For a description of the fields and buttons on this tab, see the following topic.

Utility Customers Tab

The Utility Customers tab displays the following fields and buttons:

- The header section contains details regarding a specific customer account.
  - The **Account Number** field displays the account number of the critical customer.
  - The **Name** field displays the name of the critical customer.
  - The **Address** field displays the address of the critical customer.
  - The **Client Type** menu allows you to specify a client type value for the critical customer. The available options are Undetermined, Office, Computer Data Center, Communications, Shelter, Command Center, Company Executives, and Business Leaders.
  - The **Add** button displays the Add Account dialog box. This dialog box allows you to add a critical customer into Service Alert. The main reason for doing this is to associate contact and contact phone information with the critical customer.
  - The **Edit** button places the header section into edit mode, allowing you to modify both the customer account name and the client type value.
  - The **Remove** button removes an account from Service Alert. This does not affect the customer's entries in the Oracle Utilities Network Management System tables.
  - The **Search** button displays the Search Account dialog box. This dialog box allows you to search for a critical customer that was previously added to Service Alert.
  - The **Save** button allows you to save any changes you made while the header section was in edit mode, and returns the section to non-editable mode.
  - The **Cancel** button returns the section to non-editable mode without saving any changes.
- The **Customer Devices** pane displays a list of devices that are associated with the currently selected account.
  - The **Service Location ID** column contains the service location identification value for the device.
  - The **Device ID** column contains the identification value for the device.
  - The **Load Transfer** column contains the load transfer value for the device. The available options are NONE, AUTOMATIC, and MANUAL.
  - The **Load Shed** column contains the load shed value for the device. The available options are NO and YES.
  - The **Edit** button brings up the Device Information dialog box, allowing you to modify the Load Transfer and Load Shed values of the selected device.
- The **Customer Contacts** pane contains the list of contacts for the currently selected account. For convenience, the rows in the table can be sorted in ascending or descending order by clicking on any column header.

- The **ID** column contains the system assigned unique id for the customer contact entry.
- The **Name** column contains the customer contact name.
- The **Title** column contains the customer contact title, if applicable.
- The **Instructions** column contains general instructions for contacting this individual.
- The **Add** button displays the Add/Edit Customer Contact dialog box. This dialog box allows you to add a customer contact.
- The **Edit** button displays the Add/Edit Customer Contact dialog box. This dialog box allows you to edit a customer contact.
- The **Remove** button removes the contact from the critical customer contact listing.
- The **Search…** button displays the Search Customer Contacts dialog box. This dialog box allows you to search for a customer contact that was previously added to Service Alert.

- The **Customer Contact Phones** pane displays phone information for the currently selected contact in the Customer Contacts table. For convenience, the rows in the table can be sorted in ascending or descending order by clicking on any column header.
  - The **ID** column contains the system assigned unique id for the customer contact phone entry.
  - The **Type** column contains the type of phone (Office, Home, Cell, and so on).
  - The **Number** column contains the phone number.
  - The **Ext** column contains the phone extension, if applicable.
  - The **Call Time** column contains the time of day to call the individual using this phone number (Anytime, Daytime, Nighttime, and so on).
  - The **Sequence** column contains the preferred calling order for reaching the customer contact.
  - The **Add** button displays the Add/Edit Customer Contact Phone dialog box. This dialog box allows you to add a customer contact phone entry.
  - The **Edit** button displays the Add/Edit Customer Contact Phone dialog box. This dialog box allows you to edit a customer contact phone entry.
  - The **Remove** button removes the contact phone entry from the selected contact's list of phone contact information.

Adding Accounts

The **Add Account** dialog box opens once you press the **Add** button on the Utility Customers tab. This dialog box allows you to add a critical customer into Service Alert.

The Add Account dialog box displays the following fields and buttons:

- The **Search Text** field displays the text used to search for a critical customer account. The text varies based on the search parameter.

- The **Search Parameter** field displays the current search parameter. The available parameters are Account Number, Account Name, Phone Number, Address, City State, and Zip Code.
- The **Search** button performs a critical customer search within the Oracle Utilities Network Management System database based upon the Search Text and Search Parameter.
- The **Clear** button clears the Search Text field and the search results table.
- The **Account Number** column displays the account number of the critical customer.
- The **Account Name** column displays the account name of the critical customer.
- The **Phone Number** column displays the phone number of the critical customer.
- The **Address** column displays the address of the critical customer.
- The **City State** column displays the city and state portion of the critical customer's address.
- The **Zip Code** column displays the zip code of the critical customer.
- The **Critical Types** column lists the customer's critical classification.
- The **OK** button adds the customer to Service Alert and closes the Add Account dialog box.
- The **Cancel** button closes the Add Account dialog box without adding the customer to Service Alert.

Adding an Account to Service Alert

To add an account to Service Alert, complete these steps:

1. Click the **Utility Customers** tab on the Service Alert Administration Tool.
2. Click the **Add** button. The **Add Account** dialog box opens.
3. Select a search criterion on the **Search Parameter** drop-down list.
4. Enter text into the **Search Text** field according to the search criterion selected in the previous step.
5. Click the **Search** button to perform a search for critical customers in the Oracle Utilities Network Management System database. The search result table populates with a set of customer data.
6. Select a customer by clicking on a row in the table. The **OK** button becomes enabled.
7. Click **OK** to add the customer to Service Alert, or **Cancel** to avoid adding the account.

Searching for an Account

The Search Account dialog box opens once you press the **Search** button on the header section of the Utility Customers tab in the Service Alert Administration Tool. This dialog box allows you to search for a critical customer that was previously added to Service Alert.

The Search Account dialog box contains the following information:

- The **Search Text** field displays the text used to search for a critical customer account within the Service Alert tables. The text varies based on the search parameter.
- The **Search Parameter** field displays the current search parameter. The available parameters are Account Number, Account Name, Phone Number, Address, City State, and Zip Code.
- The **Search** button performs a critical customer search within the Service Alert database based on the search text and search parameter. The search is executed against customers previously added to Service Alert by means of Adding Accounts functionality.
- The **Clear** button clears the Search Text field and the search results table.
- The **Account Number** column displays the account number of the critical customer.
- The **Account Name** column displays the account name of the critical customer.
- The **Phone Number** column displays the phone number of the critical customer.
- The **Address** column displays the address of the critical customer.
- The **City State** column displays the city and state portion of the critical customer's address.
- The **Zip Code** column displays the zip code of the critical customer.
- The **Critical Types** column lists the customer's critical classification.
- The **OK** button populates the Utility Customer pane with customer information, including contacts and contact phone entries, and closes the Search Account dialog box.
- The **Cancel** button closes the Search Account dialog box.

Searching for an Account in Service Alert

To search for an account, complete these steps:

1. Click the **Utility Customers** tab on the Service Alert Administration Tool.
2. Click the **Search** button. The Search Account dialog box opens.
3. Select a search criterion on the **Search Parameter** drop-down list.
4. Enter text into the **Search Text** field according to the search criterion selected in the previous step.
5. Click the **Search** button to perform a search for critical customers within Service Alert. The search result table populates with a set of customer data.
6. Select a customer by clicking on a row in the table. The **OK** button becomes enabled.
7. Click **OK** to display the customer data and contact information on the Utility Customer pane, or **Cancel** to avoid selecting the account.

Editing an Account

To edit an account, complete these steps:

1. Search for an Account. (Refer to the previous topic for instructions). The customer account information loads into the header section.
2. Click the **Edit** button. The Name and Client Type fields become editable.
3. Edit the **Name** field and change the selected **Client Type** as desired.
4. Click the **Save** button. The changes are saved and the header section returns to non-edit mode. In order to exit from edit mode without saving changes, click the **Cancel** button instead.

Removing an Account

To remove an account, complete these steps:

1. Search for an Account. (Refer to the previous topic for instructions). The **Remove** button becomes enabled.
2. Click the **Remove** button. The Remove Customer Account dialog box opens.
3. Click **Yes** to remove the account from the system, or **No** to avoid removing the account from the system.

Editing Customer Device Information

To edit the load transfer or load shed information for a customer device, complete these steps:

1. Add an account or search for an account, as described in the previous topics.
2. Select a row in the Customer Devices table on the Utilities Customer tab.
3. Click the **Edit** button. The Device Information dialog box opens.
4. Change the **Load Transfer** or **Load Shed** values as desired.
5. Click the **OK** button to close the dialog box and save the changes, or click the **Cancel** button to exit from dialog box without saving the changes.

Adding Customer Contact Information

To add customer contact information, complete these steps:

1. Add an account or search for an account, as described in the previous topics.
2. In the Customer Contacts section, click the **Add** button. The Add/Edit Contact dialog box opens.
3. Enter in a **Name** and **Title** for the customer contact. If applicable, enter in general instructions, or any other relevant information, regarding the contacting of the individual. The **OK** button becomes enabled.
4. Click **OK** to add the customer contact information to the database or **Cancel** to avoid adding the information.

Searching for a Customer Contact

The Search Customer Contacts dialog box opens once you press the Search button on the Customer Contacts section of the Utility Customers tab. This dialog box allows you to search for a customer contact that was previously added to Service Alert.

The Search Customer Contacts dialog box displays the following fields and buttons:

- The **Search Text** field displays the text used to search for a critical customer account within the Service Alert tables. The text varies based on the search parameter.
- The **Search Parameter** field displays the current search parameter. The available parameters are Contact Name, Contact ID, Contact Title, Account Name, and Account Number.
- The **Search** button performs a customer contact search within the Service Alert database based on the search text and search parameter. The search is executed against customer contacts previously added to Service Alert by means of the **Adding Customer Contact Information** on page 8-30 functionality.
- The **Clear** button clears the Search Text field and the search results table.
- The **Contact ID** field contains the system assigned unique id for the customer contact entry.
- The **Contact Name** column contains the customer contact name.
- The **Contact Title** column contains the customer contact title, if applicable.

- The **Account Name** column displays the account name of the critical customer the contact is already associated with.
- The **Account Number** column displays the account number of the critical customer the contact is already associated with.
- The **Add** button associates the selected contact with the currently displayed critical customer, including contacts and contact phone entries, adds a row for this contact to the Customer Contacts table, and closes the Search Customer Contacts dialog box.
- The **Cancel** button closes the Search Customer Contacts dialog box.

Searching for a Customer Contact in Service Alert

To search for a customer contact, complete these steps:

1. Add an account or search for an account.
2. Click the **Search** button. The Search Customer Contacts dialog box opens.
3. Select a search criterion on the **Search Parameter** drop-down list.
4. Enter text into the **Search Text** field according to the search criterion selected in the previous step.
5. Click the **Search** button to perform a search for customer contacts within Service Alert. The search result table populates with a set of customer data.
6. Select a customer contact by clicking on a row in the table.
7. Click **Add** to associate the customer contact with the critical customer currently displayed on the Utility Customer pane, or **Cancel** to avoid adding a contact.

Editing Customer Contact Information

To edit customer contact information, complete these steps:

1. Search for an account that has customer contacts associated with it.
2. In the Customer Contacts section, click the **Edit** button. The Add/Edit Contact dialog box opens.
3. Edit the **Name**, **Title**, and **Instructions** associated with the customer contact. The **OK** button becomes enabled.
4. Click **OK** to save the edited customer contact information to the database or **Cancel** to avoid saving the information.

Removing Customer Contact Information

To remove customer contact information, complete these steps:

1. Search for an account that has customer contacts associated with it.
2. Click on one of the existing contacts in the **Customer Contacts** table. The **Remove** button becomes enabled.
3. Click the **Remove** button. The Remove Contact dialog box opens.
4. Click **Yes** to remove the contact's association with this account, or **No** to avoid removing the contact association.

Adding Customer Contact Phone Information

To add customer contact phone information, complete these steps:

1. Add an account or search for an account.
2. If the account does not have any associated contacts, add a customer contact.
3. Click on one of the existing contacts in the **Customer Contacts** table. The **Add** button becomes enabled.
4. Click the **Add** button. The Add/Edit Customer Contact Phone dialog box opens.
5. Modify the phone type and call time from the **Type** and **Call Time** drop-down lists, respectively.
6. Enter a phone number in the **Number** field. If applicable, a phone extension can be entered in the text field to the right of the Number field.
7. Enter a non-negative value in the Sequence field. This number is used to indicate the priority of this phone entry relative to all other phone entries associated with the selected customer contact. The **OK** button becomes enabled.
8. Click **OK** to save the customer contact phone information to the database, or **Cancel** to avoid saving the phone information.

Editing Customer Contact Phone Information

To edit customer contact phone information, complete these steps:

1. Search for an account that has customer contacts associated with it.
2. Click on one of the existing contacts in the **Customer Contacts** table. The **Edit** button becomes enabled.
3. Click the **Edit** button. The Add/Edit Customer Contact Phone dialog box opens.
4. Modify the phone type and call time from the **Type** and **Call Time** drop-down lists, respectively.
5. Edit a phone number in the **Number** field. Edit the phone extension in the text field to the right of the **Number** field.
6. Edit value in the **Sequence** field.
7. Click **OK** to save the customer contact phone information to the database, or **Cancel** to avoid saving the phone information.

Removing Customer Contact Phone Information

To remove customer contact phone information, complete these steps:

1. Search for an account that has customer contacts associated with it.
2. Click on one of the existing contacts in the **Customer Contacts** table.
3. Click on one of the contact phone entries in the **Customer Contact Phones** table. The **Remove** button becomes enabled.
4. Click the **Remove** button. The Remove Phone dialog box opens.
5. Click **Yes** to remove the contact's selected phone entry, or **No** to avoid removing the entry.

Attribute Manager

The Attributes Manager tab is used to add, edit, or remove attribute information associated with specific devices. Attribute Information can be displayed on notifications trigger by the associated device. An attribute consists of a Device ID, Attribute ID, a name and a value. Inactive attributes cannot be violated, and therefore will never trigger a notification.

The Attributes Manager tab allows you to perform the following tasks:

- Adding Attributes
- Editing a Attribute
- Removing a Attribute

For a description of the fields and buttons on this tab, see the following topic.

Attributes Manager Tab

The Attributes Manager tab displays the following fields and buttons:

- The **Attributes** pane lists all attributes known to Service Alert. Note that the table row colors correspond to whether a attribute is active (white) or inactive (bluish gray). For convenience, the rows in the table can be sorted in ascending or descending order by clicking on any column header.

  The columns displayed are user selectable by right-clicking the table heading area and selecting or deselecting the list of available columns in the **Select Columns to Display** dialog box. Once the columns have been chosen, you may save the choices for your subsequent sessions by selecting **Save Preferences** from the **Preferences** menu; if not saved, the default columns will be displayed when you log in again. See **Manage Preferences Menu** on page 8-5 for details on saving and restoring column selections.

  The default product configuration displays the following columns:

  - The **Device ID** column contains the device to which the attribute applies.
  - The **Attribute Name** column contains a descriptive name given to the attribute.
  - The **Attribute Value** column contains a value given to the attribute.
- The **Add** button displays the Device Search dialog box, allowing you to search for a device to associate with the attribute.
- The **Edit** button allows you to edit the currently selected attribute.
- **Remove** button removes the currently selected attribute from the Service Alert.

The **Attribute Information** pane is where the details for an attribute are entered and/or edited.

- The **Device ID** field displays the alias of the device to which the attribute applies.
- The **Attribute ID** field displays the system assigned internal id for the attribute.
- The **Attribute Name** field displays the descriptive name given to the attribute. This value can be modified be when in add/edit mode.

- The **Attribute Value** field displays the value given to the attribute. This value can be modified be when in add/edit mode.
- The **Active** check box allows you to enable/disable the attribute.
- The **Save** button saves the attribute information.
- The **Cancel** button cancels an add/edit attribute operation.

Adding Attributes

An attribute consists of a name and a value associated to a device or customer. The attribute information can be displayed on notifications trigger by the associated device.

1. Click the **Attribute Manager** tab on the Service Alert Administration Tool.
2. Click the **Add** button to bring up the Device Search dialog box.
3. Enter into the **Search Text** field your search criteria.
4. Click the **Search** button. The search results are displayed in the table.
5. Select the desired device from the table, and then click the **OK** button. The Device Search dialog box disappears, and the Device ID field is populated with the name of the selected device.
6. Enter a descriptive name for the attribute into the **Attribute Name** field.
7. Enter a value for the attribute into the **Attribute Value** field.
8. Select/deselect the **Active** check box as desired.
9. Click the **Save** button to save the attribute.

Editing a Attribute

To edit an attribute, complete these steps:

1. Click the **Attribute Manager** tab on the Service Alert Administration Tool.
2. Click on one of the existing attributes in the **Attributes** table. The **Edit** button becomes enabled.
3. Click on the **Edit** button. The appropriate fields will become enabled.
4. Edit each field as desired.
5. Click **Save** to save the edited information, or click **Cancel** to avoid saving the edited information.

Removing a Attribute

To remove an attribute, complete these steps:

1. Click the **Attribute Manager** tab on the Service Alert Administration Tool.
2. Click on one of the existing attributes in the **Attributes** table. The **Remove** button becomes enabled.
3. Click the **Remove** button. The Remove Attribute dialog box opens.
4. Click **Yes** to remove the attribute or **No** to avoid removing the attribute.

Chapter 9

Management Reporting

Documentation for Oracle Utilities Network Management System Management Reporting may be found in the Oracle Utilities Analytics documentation.

Chapter 10

SCADA Extensions

This chapter covers **Oracle Utilities Network Management System (NMS) – SCADA Extensions**, including the following topics:

- Overview
- Understanding SCADA Measurements
- Accessing and Using SCADA Features
- Using the SCADA Summary
- Understanding SCADA Information in the Viewer
- Remote SCADA Operation Warnings
- Using SCADA Control Tool Features
- Switching Management SCADA Integration
- Vendor-Specific SCADA Integrations

Overview

SCADA Extensions offers extended functions that enhance the capabilities of the Work Agenda, Viewer, Control Tool, and Web Switching Management applications. It also provides SCADA Summary, a window to display information about mapped SCADA measurements. These extended functions incorporate real-time data from a Supervisory Control and Data Acquisition (SCADA) system.

SCADA Extensions is required in order to display any SCADA data in **NMS**, whether it is through the Oracle Utilities Network Management System – SCADA ICCP Block 1, 2, and 5 Adapter interface or a custom interface. The interface itself is a separate component from the **NMS** and **SCADA Extensions**.

There are two basic types of SCADA interfaces employed. A one-way interface provides **NMS** with real time values for SCADA digital and analog measurements as well as quality codes, tags, and alarms. A two-way interface also allows the remote control of SCADA devices from within **NMS**.

Understanding SCADA Measurements

There are three possible types of SCADA measurements that SCADA Extensions can display:

- **Analog** - Numeric measurements of the distribution system operating conditions at SCADA devices, such as amps, kVAr, and volts.
- **Status** - Binary values, such as OPEN/CLOSE and ON/OFF. Status values related to switches are mapped into the topological status of switchable devices that affect the energization of the distribution model. Other status values, such as reclose, enabled, loop scheme indication, lightning mode, and fault indicators, are displayed as text pairs of symbols.
- **Digital** - Whole-integer value measurements indicating the state of the device, such as tap positions or counters. The **NMS** SCADA ICCP Block 1, 2, and 5 Adapter does not currently support digital whole-integer measurements. However, these values can be available if converted through a custom adapter into engineering values.

Understanding Measurement Quality Codes

Quality codes provide information about the quality of the measurement coming from the SCADA system. Examples may include held, suspect, not valid, telemetered, calculated, entered, estimated, abnormal, off scan, SCADA error, and tag on. Additionally there are quality codes that may be applied to a SCADA measurement from the **NMS** applications. These include alarm inhibited and manually overridden.

The following quality codes are internal codes created and maintained by the NMS:

- **A:** Alarm
- **D:** Alarm Disabled
- **F:** Comms Fail (Stale)
- **H:** High Limit
- **I:** Device Inhibited
- **L:** Low Limit
- **M:** Manual Entry
- **O:** Off-nominal
- **R:** Out of Range
- **S:** Suspect
- **U:** Unacknowledged Alarm

The following additional quality codes may be configured and modified to be supplied by the Oracle Utilities NMS SCADA ICCP Block 1, 2, and 5 Adapter:

- **?:** Suspect
- **h:** Held
- **a:** Abnormal
- **b:** Between
- **c:** Calculated
- **e:** Estimated
- **f:** Rtu Comms Fail
- **m:** Manual Entered
- **x:** Invalid
- **X:** Not Valid

Accessing and Using SCADA Features

SCADA information can be accessed in NMS in several different ways and for different purposes.

- SCADA operations that result in customers out appear as real outage events on the trouble related views of the Work Agenda in the same manner as outages that were generated by call information except that they are automatically confirmed and appear immediately as real outages. These operations are also included on the Device Operations List on the Work Agenda.
- The SCADA Summary provides the current values and qualities of all mapped SCADA measurements in **NMS**, including both analog and digital measurements. You can filter, sort, modify, and comment on the measurements in the SCADA Summary.
- The Viewer displays dynamically updated SCADA information at or near the corresponding device on the distribution network map. The data may be displayed via text annotation or, in the case of status and digital values, symbol changes. SCADA information that may be displayed on the Viewer includes switch status and other status values, digital values, and analog values, all with quality codes.
- The Viewer also shows all SCADA analog and digital values in the balloon dialog box.
- The Alarms list is an extension of the Work Agenda window and may display various alarm messages that are sent from the SCADA system.
- Any SCADA status values that result in a switch being in its off-nominal state will cause the device to appear in the Abnormal Device Summary.
- Systems with a two-way interface let you perform remote operations (for example, open/close and tagging) on SCADA device through an enhanced version of the Control Tool.

Using the SCADA Status Window and Configuration Tools

The following SCADA maintenance tools are provided in Oracle Utilities Network Management System.

- SCADA Status
- FEP Monitor
- IED Monitor
- Point Monitor
- FEP Details
- IED Details
- Templates
- Audit Log
- Debug Log

To display the SCADA Maintenance Tools, select **SCADA Status** from the Web Workspace **Tools** menu.

Understanding the SCADA Status Window

The **SCADA Status** tool provides an overview of the configured SCADA interfaces and consists of two panes. On the left, a tree view shows the current status of items in the SCADA system; on the right, a docked frame displays one or more other SCADA maintenance tool:

Understanding the SCADA Status Window Menus

File Menu

Menu Option	Description	Toolbar Icon
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	--
Exit	Closes the SCADA Status window.	--

Tools Menu

Menu Option	Description	Toolbar Icon
Display FEP Monitor...	Opens the FEP Monitor in the docked pane. See **Understanding the FEP Monitor** on page 10-6 for information.	--
Display IED Monitor...	Opens a tab for the IED Monitor in the docked pane. See **Understanding the IED Monitor** on page 10-9 for information.	--
Display Point Monitor...	Opens a tab for the Point Monitor in the docked pane. See **Understanding the Point Monitor Tab** on page 10-14 for information.	--
Display IED Templates	Opens a tab for a new IED Template in the docked pane. See **Understanding the IED Templates Tab** on page 10-15 for information.	--
Display Audit Log...	Opens a tab for a new IED Template in the docked pane. See **Understanding the Audit Log Tab** on page 10-15 for information.	--
Display Debug Log...	Opens a tab for a new IED Template in the docked pane. See **Understanding the Debug Log Window** on page 10-16 for information.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Create New FEP	Opens the FEP Details tool allowing the user to create a new FEP.	
Create New IED...	Opens the IED Details tool allowing the user to create a new IED.	
Create New IED from Template...	Creates a new IED as copy of a preconfigured template and opens the IED Details on the resulting new IED.	
Unlink IED...	Immediately disassociates the currently selected IED from the FEP and moves it to the unassociated list.	--
Move IED...	Invokes the Associate IED dialog allowing the user to associate the currently selected IED to one of the configured FEPs.	--

Help Menu

Menu Option	Description	Toolbar Icon
SCADA Status Help	Opens online help content for the SCADA Status window	--

Understanding the SCADA Status Tree View Pane

The tree view pane displays the configured Front End Processors (FEPs) and the Intelligent Electronic Devices (IEDs) that are associated with them.

The **Unassociated** node at the top of the tree view contains any IEDs not currently associated with a FEP. The Unassociated node is where new IED instances are created and updated until ready to be made active. If you right-click a tree node, the context menu will display various operations that can be performed on the selected item.

Understanding the FEP Monitor

The FEP Monitor tool consists of three sections:

- FEP Status List
- SCADA Message Counts
- Message Queues

FEP Status List

The FEP Monitor List is a table that shows the current state of all Front End Processors (FEPs) configured in the system. Each row in the FEP monitor list shows information about a FEP and a specific connection configured for that FEP. Therefore, if a FEP has multiple configured connections then that FEP may show up in the list multiple times, once for each connection. Only one FEP row can be selected and a time and when a FEP is selected a right click context menu allows you to choose from the available actions to be performed on that FEP. The context menu will only show that actions valid for the current state of the FEP, for example if the FEP is in the enabled state then the Enable FEP option will not be available.

Context Menu Options

Depending on what you select, you may have the following options.

- **FEP Details:** Open the FEP Details tool allowing edit of the configurable FEP options.
- **Show IEDs for the Selected FEP:** Opens the IED Monitor filtered to only display IEDs that are configured for the selected FEP.
- **Enable FEP:** Enables the selected FEP.
- **Disable FEP:** Disables the selected FEP.
- **Change Active Connection:** Changes the communications channel used to communicate to the FEP. Only visible if the FEP has multiple channels configured.

- **Reset FEP Statistics:** Resets the communication statistics for the selected FEP.
- **Reset All IED Statistics:** Resets the communication statistics for all IEDs configured on the selected FEP.
- **Enable Debug:** Enables the logging of debug messages for the selected FEP.
- **Disable Debug:** Disables the logging of debug messages for the selected FEP.
- **Synchronize:** Resynchronizes the FEP configuration to the FEP itself.
- **Create New IED:** Opens the IED Details tool, which allows you to create a new IED.
- **Create New IED from Template:** Creates a new IED as copy of a preconfigured template and opens the IED Details on the resulting new IED.
- **Delete FEP:** Deletes the FEP. This action will only complete if the FEP has no IEDs configured.

FEP Connection Options
The FEP Connection context menu provides the following options.

- **Enable Connection:** Enables the selected FEP connection.
- **Disable Connection:** Disables the selected FEP connection.
- **Change Active Connection:** Changes the communications channel used to communicate to the FEP. Only visible if the FEP has multiple channels configured.

Understanding the FEP Details

FEP Details opens in a tab that is used to view and edit the detailed options required to setup a FEP within the system. The tab name follows this pattern: FEP Details, a dash, and then the FEP Identifier (for example, **FEP Details - FEP_ID**).

File Menu

Menu Option	Description	Toolbar Icon
Save	Saves changes made in the FEP Details tool.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	--
Exit	Closes the SCADA Status window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Disable FEP	Disables the selected FEP	
Enable FEP	Enables the selected FEP	
Add FEP	Creates a new FEP.	
Remove FEP	Removes the selected FEP component.	
Add Connection	Adds a new connection to the FEP.	
Delete Connection	Deletes the current connection.	
Enable Connection	Enables the selected FEP connection.	
Disable Connection	Disables the selected FEP connection.	
Change Active Connection	Changes the communications channel used to communicate to the FEP. Only visible if the FEP has multiple channels configured.	

Help Menu

Menu Option	Description	Toolbar Icon
FEP Details Help	Launches online help for FEP Details.	--

The FEP Details tool is comprised of two main sections:-

- Common Options
- Connection List

FEP Common Options

The FEP Common options are typically the following:

- **Control:** The configured state of the FEP. This is updated by actions menu options.
- **Status:** The actual state of the FEP as reported by the system (not editable).
- **Name:** A unique FEP name in the system, used for logging audit messages and errors.

- **Description:** Optional description.
- **Debug:** Defines whether internal debug information is logged for this FEP or not.
- **Keep Alive:** The interval in milliseconds between keep alive messages to the FEP. A value of zero disables the keep alive functionality.

FEP Connections List
This section allows the configuration of one or more connections between the NMS system and the FEP itself. This could be redundant connections to the same FEP instance or connections to redundant FEPs. Connections can be added or removed as required, and also enabled or disabled from a right-click context menu.

Each connection has the following options:

- **Control:** The configured state of the connection. This is edited by actions menu options.
- **Status:** The actual state of the connection as reported by the system (not editable).
- **Name:** A unique (on the FEP) name for the connection, used for logging audit messages and errors.
- **Description:** Optional description.
- **Order:** A defined order to try the connections - lowest value first.
- **IP Address:** The TCP/IP address of the FEP for the connection.
- **Port:** The TCP/IP port for the connection.

Understanding the IED Monitor

The IED Monitor List is a table that shows the current state of all Front End Processors (FEPs) configured in the system. Each row in the FEP monitor list shows information about a FEP and a specific connection configured for that FEP. Therefore if a FEP has multiple configured connections then that FEP may show up in the list multiple times, once for each connection. Only one FEP row can be selected and a time and when a FEP is selected a right click context menu allows you to choose from the available actions to be performed on that FEP. The context menu will only show that actions valid for the current state of the FEP, for example if the FEP is in the enabled state then the Enable FEP option will not be available.

Understanding IED Details

The IED details tool is used to view and edit the detailed options required to setup an IED within the system. This information is displayed in four main sections:

- Common Options
- Default Analog Scaling Options
- Protocol Specific Options
- Connections List

IED Common Options

The IED common options consists of the following fields:

- **Control:** The configured state of the IED. This is updated by actions menu options.
- **Status:** The actual state of the IED as reported by the system (not editable).
- **Name:** A unique IED name in the system, used for logging audit messages and errors.
- **Protocol:** Wwhat protocol is used to communicate with the IED.
- **Commission:** The commissioned state of the IED.
- **FEP:** Which FEP will communicating to the IED.

IED Default Scaling Options

The default scaling options are a definition of the analog scaling values that will be used for all analogs on an IED unless overridden by values on the input itself:

- **Absolute Change:** Default required absolute difference before being reporting
- **Percent Change:** Default required percentage difference before being reporting
- **Offset Before Multiply:** Default add value before multiply operation - use negative value for subtraction
- **Offset After Multiply:** Default add value after multiply operation - use negative value for subtraction
- **Scale Multiplier:** Default multiplier for analog values

IED Protocol Specific Options

The protocol specific section of the IED details screen varies depending of which protocol is to be used to communicate to the IED.

- DNP3 Options
- IEC60870-5-104 Options
- ICCP Options

DNP Options

- **Local Address:** Local DNP3 station number.
- **Remote Address:** Remote DNP3 station number.
- **IED Mode:** Run as outstation instead of master. Y=IED N=Master (Default).
- **Listen Mode:** Listen for inbound connection instead of making outbound. Defaults to outbound.
- **Class Zero Poll Rate:** Poll rate in seconds for Class 0 polling. Defaults to 0 (no polling).
- **Class One Poll Rate:** Poll rate in seconds for Class 1 polling. Defaults to 0 (no polling).
- **Class Two Poll Rate:** Poll rate in seconds for Class 2 polling. Defaults to 0 (no polling).
- **Class Three Poll Rate:** Poll rate in seconds for Class 3 polling. Defaults to 0 (no polling).
- **Max Msg Size:** Max DNP3 message size.

- **Ack Timeout:** Timeout in ms to recv ack from peer.
- **Response Timeout:** Timeout in ms to recv response from peer.
- **Refresh Mode:** Reset connection on failure to receive response from peer within timeout.
- **Multi Drop ID:** Multi-drop id, when one connection is shared among multiple DNP3 outstations (SERIAL mode only).
- **Baud Rate:** Serial line Baud rate (SERIAL mode only).
- **Parity:** Serial line parity (SERIAL mode only).

IEC60870-5-104 Options

- **Connect timeout (T0):** Connection establishment timeout. Range 1 s to 255 s, accuracy 1 s. default 30 seconds.
- **APDU timeout (T1):** APDU timeout. Range 1 s to 255 s, accuracy 1 s. default 15 seconds.
- **Acknowledge timeout (T2):** APDU acknowledge timeout. Range 1 s to 255 s, accuracy 1 s. default 10 seconds, must be less than t1 ADPU timeout.
- **Idle timeout (T3):** Idle Timeout. Range 1 s to 48 h, resolution 1s, default 20 seconds.
- **Max APDU Transmit (K):** Maximum outstanding I format transmitted APDU, default 12. Range of values 1 to 32767 APDUs, accuracy 1 APDU.
- **Max APDU Receive (W):** Maximum outstanding I format received APDU, default 8. Range 1 to 32767 APDUs, accuracy 1 APDU - Recommendation: W should not exceed two-thirds of K.
- **Station Address:** Local IEC104 station number.
- **Server Mode:** Run as server instead of client. Y=Server N=Client (Default).

ICCP Options

- **TSEL:** Transport selector.
- **SSEL:** Session selector.
- **PSEL:** Presentation selector.
- **AP Title:** Application Process Title.
- **AE Qualifier:** Application Entry Qualifier.
- **Local Domain:** Local domain name.
- **Remote Domain:** Remote domain name.
- **Local Table ID:** Local Bilateral Table ID.
- **Remote Table ID:** Remote Bilateral Table ID.
- **TCP/IP Address:** Optional IP address for the Local VCC - Gates incoming connections, default is to accept connections on any IP address.
- **Block 1:** Periodic System Data: Status points, analogue points, quality flags, time stamp, change of value counter, protection events.

- **Block 2:** Extended Data Set Condition Monitoring: Provides report by exception capability for the data types that block 1 is able to transfer periodically.
- **Block 3:** Block Data Transfer: Provides a means transferring Block 1 and Block 2 data types as block transfers instead of point by point.
- **Block 4:** Information Messages: Simple text and binary files.
- **Block 5:** Device Control: \nDevice control requests: on/off, trip/close, raise/lower etc. \nand digital setpoints.
- **Block 6:** Program Control: Allows an ICCP client to remote control programs executing on an ICCP server.
- **Block 7:** Event Reporting: Extended reporting to a client of error conditions and device state changes at a server.
- **Block 8:** Additional User Objects: Scheduling, accounting, outage and plant information.
- **Connection Mode:** Connection direction - Inbound, Outbound, or Dual.
- **Role:** ICCP role (Client, Server, or Both).
- **Reduce List:** ICCP behavior option - negotiate non-existent points in transferset definitions.
- **Mismatch Flag:** ICCP behavior option - create csv file listing non-existent points in transferset definitions.
- **Keep Alive:** Periodically send MMS Identify request as keep-alive. Default=0 meaning do not send.
- **Secure Mode:** Enable/Disable secure ICCP.
- **TLS Certificate:** TLS public client certificate, or local private server certificate identifier - Secure Only.
- **ACSE Certificate:** ACSE public certificate, or local private certificate identifier - Secure Only.

IED Connections List

This section allows the configuration of one or more connections between the FEP and the IED itself. This is normally redundant connections to the same IED instance. Connections can be added or removed as required, and also enabled or disabled from a right-click context menu.

Each connection has the following options:

- **Control:** The configured state of the connection. This is edited by actions menu options.
- **Status:** the actual state of the connection as reported by the system (not editable).
- **Name:** A unique (on the IED) name for the connection, used for logging audit messages and errors.
- **Description:** optional description.
- **Order:** A defined order to try the connections – lowest value first.
- **IP Address:** The TCP/IP address of the FEP for the connection.

- **Port:** The TCP/IP port for the connection.
- **Poll Period:** The period to collect poll statistics in seconds.
- **Stats Period:** The frequency to report the statistics.
- **Recovery Percent:** Required percentage of good vs bad polls for connection recovery.
- **Failure Percent:** Required percentage of good vs bad polls for connection failure.

ICCP Remote VCC List – only for ICCP IEDs
This ICCP Remote VCC definition has all of the same columns as the IED connections defined above and the following additional columns

- **TSEL:** Transport selector.
- **SSEL:** Session selector.
- **PSEL:** Presentation selector.
- **AP TITLE:** Application Process Title.
- **AE QUALIFIER:** Application Entry Qualifier.
- **Application Entry Qualifier:** TLS public client certificate, or local private server certificate identifier - Secure Only.
- **ACSE CERTIFICATE:** ACSE public certificate, or local private certificate identifier - Secure Only.
- **TLS CA CERTIFICATE:** TLS public Certificate Authority certificate identifier - Secure Only.
- **ACSE CA CERTIFICATE:** ACSE public Certificate Authority certificate identifier - Secure Only.

ICCP Transfersets – only for ICCP IEDs

- **Control:** Configured state of Transferset.
- **Status:** Actual state of Transferset.
- **Number:** Dataset Number - referenced by points.
- **Transfer Mode:** Specify change-based or interval transmission of information reports.
- **Start Time:** Absolute start time of transfer set.
- **Start Delay:** Start Delay for transferset (not used).
- **Buffer Time:** Time in seconds to queue data on server before sending report.
- **Interval:** Interval in seconds for INTERVAL transferMode.
- **Integrity Interval:** Interval in seconds to send integrity scan reports. Default/0 means no integrity scan reports.
- **Operator Request:** Enable operator request.
- **Report By Exception:** Report By Exception mode for INTERVAL reports - only send points when they have changed over interval.
- **All Changes:** Send lists of all changes with INTERVAL reports.

- **Critical:** Enable critical ACK.
- **Initial Read:** Do initial read of all points in data set.

Understanding the Point Monitor Tab

The point monitor is a point list that can be used to display the current value and quality of input points from any IED or combination of IEDs. Using the option on the right-click context menu of the IED input tool the user can choose the 'Add to point Monitor' option to add the selected points to the point monitor list. This list is common for all points and so does not contain any protocol specific columns. The context menu on the point monitor row allows the user to position on the relevant component in the diagram, or to remove the point from the point monitor list.

Using Point Monitor Menus and Toolbar

File Menu

Menu Option	Description	Toolbar Icon
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	--
Exit	Closes the FEP Monitor tab.	--

Tools Menu

Menu Option	Description	Toolbar Icon
View	Focuses the Viewer on the selected device.	

Actions Menu

Menu Option	Description	Toolbar Icon
Remove Point	Removes the point from the Point Monitor.	--

Sort Menu
The table below describes the options available on the **Sort** menu.

Menu Option	Description	Toolbar Icon
Sort Dialog...	Opens the Sort Dialog, allowing you to create, modify, apply, and save user-defined sorts. See **Using the Sort Dialog Box** on page 1-9.	--
Default	Applies the default sort. In the product configuration, the default sort is by Point ID.	--
Type	Applies the sort by input type. In the product configuration, this sort is by Point ID and Type.	
IED Name	Applies the sort by IED. In the product configuration, this sort is by Point ID and IED Name.	

Understanding IED (Filtered) Views
Point monitor Views are filters based on the type of the point in the point monitor list. In the standard out of the box NMS product offering the point monitor starts with displaying all inputs assigned to the monitor. The currently active filter is displayed above the table along with the current sort option.

The point monitor is pre-configured with several different global filters that can be selected in the filters panel. Your system may also have several shared filters and any personal filters that you have created and saved.

The NMS product configuration includes the following Global filters

- **All Inputs:** Displays both analog and digital inputs.
- **Analog Inputs:** Displays only analog inputs.
- **Digital Inputs:** Displays only digital inputs.

Understanding the IED Templates Tab

The IED List columns are as follows

- **IED ID:** The unique ID of the IED (normally a hidden column).
- **Control:** Whether the template is active or not - disabled templates can not be used.
- **Name:** The unique name for the template IED.
- **Protocol:** The protocol used to communicate with the IED.
- **Description:** An optional description for the template.

Understanding the Audit Log Tab

The SCADA Audit Log provides a chronologically documented audit trail of SCADA maintenance and operational events.

The SCADA Audit Log is pre-configured with several different global filters that can be selected in the filters panel. Your system may also have several shared filters and any personal filters that you have created and saved.

Understanding the Debug Log Window

The SCADA Debug Log provides a chronologically documented log of SCADA debug messages.

The SCADA Debug Log is pre-configured with several different global filters that can be selected in the filters panel. Your system may also have several shared filters and any personal filters that you have created and saved.

Using the SCADA Summary

The SCADA Summary provides the current values and qualities of all mapped SCADA measurements in Oracle Utilities Network Management System. Each row of this summary represents one measurement. There may be multiple unique measurements on one SCADA device. SCADA information includes digital and analog measurements, along with the quality codes and any user comments for each measurement. You can use the summary to view measurement information, manually replace current SCADA values, and inhibit updates.

This section includes the following topics:

- Understanding the SCADA Summary Window
- Preventing Measurement Updates
- Manual Entry and Override of SCADA Measurement Values

Understanding the SCADA Summary Window

The SCADA Summary may be opened to view all SCADA measurements or for measurements related to a device or feeder selected in the Viewer. The SCADA Summary displays the following fields and buttons:

- The **Feeder** column contains the name of the feeder reporting the SCADA measurements.
- The **Substation** column contains the substation name.
- The **Device** column contains the name of the device reporting the SCADA measurements.
- The **Value** column contains the last reported measurement value. The value can be status, digital, or analog. For status measurements, the values are displayed as a test pair, such as open/close, on/off, and so on. Analog and digital values are shown as floating point and integer values.
- The **Quality** column contains the Quality codes for the measurement that indicates the quality of the SCADA measurement (for example, out of scan, inhibited, manual override). Several quality codes can be listed.
- The **Point Name** column displays the name of the SCADA measurement, as used in the SCADA system.
- The **Attribute** column contains a description of the measurement type, as configured in the ATTRIBUTES.description column in the Oracle Utilities Network Management System database for the matching attribute.
- Depending on your system's configuration, you may have the ability to enter comments when manually changing SCADA status (for example, **Inhibit**, **Manual Override**, or **Disabled in Power Flow**). See **Adding and Modifying Comments for SCADA Status Changes** on page 10-22 for more information.

If this feature is configured, you will see the following columns:

- The **Comments** column contains the text of a comment entered when changing device status.
- The **User** column displays the name of the user who entered/modified comments when changing the device status.

- The **Date** column displays the date and time when the comment was entered or modified.

Toolbar and Menu Options

File Menu

Menu Option	Description	Toolbar Icon
Print...	Displays the Print Preview window, from which you can view and print the summary.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the SCADA Summary window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Inhibit	**Inhibit** sets the inhibit quality code for the selected SCADA measurement. This suppresses any new updates from SCADA.	
Cancel Inhibit	**Cancel Inhibit** removes the inhibit quality code from the selected SCADA measurement. This allows any new updates from SCADA to be displayed.	
Manual Entry...	**Manual Entry** allows you to enter a new value for the selected SCADA measurement. When a changed SCADA value is received by the system, it replaces the manually entered value.	
Manual Override...	**Manual Override** allows you to enter a new value for the selected SCADA measurement. When a new SCADA value is received by the system, the measurement is blocked and the manually entered value remains.	
Cancel Override	**Cancel Override** cancels the manual override for the selected measurement and reverts the selected measurement to the last received value from the SCADA system.	
Disable in Power Flow	**Disable in Power Flow** disables the selected measurements from being included in the power flow solution.	
Enable in Power Flow	**Enable in Power Flow** re-enables the selected disabled measurements in the power flow solution.	

Menu Option	Description	Toolbar Icon
Reverse Polarity	**Reverse Polarity** sets the Reversed (r) quality code on the measurement, which then negates the value, to improve power flow calculations. Note that any subsequent manual entries and manual overrides will also be negated, as if they were SCADA readings.	
Undo Reverse Polarity	**Undo Reverse Polarity** undoes the Polarity Reversal and reverts to the last received SCADA value.	
Edit Comment...	**Edit Comment** allows you to modify an existing comment for the selected measurement. See **Adding and Modifying Comments for SCADA Status Changes** on page 10-22 for more information.	
Control Tool	Brings up the control tool for the selected measurement's device.	
Trend Graph	Trend Graph for all phases of the attribute.	
View...	**View** focuses the Viewer on the device.	
Navigate to SCADA	If configured, submenu options open windows in the native SCADA application (currently supported by OSI). For more information, see **OSI SCADA Integration** on page 10-30.	
Load Feeder	Loads additional data for all SCADA measurements on a feeder when the SCADA Summary is displaying device data. **Note:** This option is only available when the SCADA Summary is launched from the Control Tool.	
Load Substation	Loads additional data for all substation measurements when the SCADA Summary is displaying device or feeder data. **Note:** This option is only available when the SCADA Summary is launched from the Control Tool.	
Load Adjacent Sub	Loads additional data for adjacent substations. **Note:** This option is only available when the SCADA Summary is launched from the Control Tool.	
Load All	Repopulates the SCADA Summary with all measurements. This clears any device, feeder, or substation filters; see **Viewing SCADA Data for a Selected Device** on page 10-20.	

Help Menu

Menu Option	Description	Toolbar Icon
SCADA Summary Help	Opens the online help system to the SCADA Summary help content.	--

Understanding the SCADA Summary Filter Pane

The SCADA Summary provides the following standard Global filters:

Filter Name	Description
All Measurements	Displays all rows in the SCADA Summary table. All is the default view.
AMI Bellwether	Displays bellwether AMI voltage rows.
Analogs	Displays rows with analog values.
Digitals	Displays rows with digital values.
Equipment	Displays rows with equipment values.
Statuses	Displays rows with status value.

Viewing Data in the SCADA Summary

Viewing All SCADA Data

To open the SCADA Summary for all measurements, select **SCADA Summary...** from the Web Workspace **Tools** menu.

Viewing SCADA Data for a Selected Device

To open the SCADA Summary for a specific device, select the device or feeder in the Viewer and launch the Control Tool. Click **SCADA Summary...** and select one of the options:

- **Device...:** loads the SCADA Summary with the SCADA measurement data for the selected device.
- **Feeder...:** loads the SCADA Summary with SCADA measurement data for the selected device's feeder.
- **Substation...:** loads the SCADA Summary with SCADA measurement data for the selected device's substation.

When the SCADA Summary is launched from the Control Tool, the data source is shown in a bar above the table.

> **Note:** If you select **Load All** from the SCADA Summary **Actions** menu or click the **X** button ( ) on the bar above the table, the table will be repopulated with all measurements and the bar will be removed.

Loading SCADA Summary Data for a Different Device

Once the SCADA Summary has been opened (from the Control Tool), you can view data for a different device by selecting it in the Viewer, and then clicking the **Load** button in the bar above the data table.

Preventing Measurement Updates

To prevent a SCADA measurement from accepting updates from SCADA, complete the following steps:

1. Select **SCADA Summary...** from the Web Workspace **Tools** menu. The SCADA Summary window opens.
2. Select a row in the SCADA Summary table corresponding to the device measurement that you want to prevent from updating.
3. Click the **Inhibit** button.

Manual Entry and Override of SCADA Measurement Values

Occasionally, you may need to manually enter a status, digital value, or analog value for a SCADA measurement. For example, you may need to enter fault current and fault indicators to trigger Fault Location Analysis (if applicable). See Chapter 19, Fault Location Analysis for more information.

If the value for the selected measurement is a switch status measurement (that is, open/close), you must choose **Show Control Tool...** from the context menu to manually operate the switch. Otherwise, use the following procedure to enter a value manually:

1. Select **SCADA Summary...** from the Web Workspace **Tools** menu. The SCADA Summary window opens.
2. Select the SCADA measurement row in the SCADA Summary list.
3. Click either the **Manual Entry** or **Manual Override** button.

   Note: Manual Entry allows future SCADA value changes to replace the manually entered value. Manual Override prevents SCADA measurements received by the system from changing the manually entered value. Manual Override can be useful when testing specific devices or RTU communications offline, since the test operations can be prevented from creating outages in Oracle Utilities Network Management System by putting manual overrides on the appropriate status measurements.

   If the value for the measurement is a multi-state digital, analog, or any type of measurement other than a switch status measurement (open/close), a dialog box opens, allowing you to enter a value.

   Note: Multi-state digitals are not available through the Oracle Utilities Network Management System SCADA ICCP Block 1, 2, and 5 Adapter.
4. Select or enter the value you want to change the measurement to.
5. Click **OK**.

   Note: Clicking **Manual Override** blocks any new values coming from the SCADA measurement. It does not affect the physical SCADA

device, it only blocks the value reported by the SCADA device to Oracle Utilities Network Management System.

Adding and Modifying Comments for SCADA Status Changes

When you change the SCADA state to Inhibit, Manual Override, or Disabled in Power Flow, you can enter comments to record why the state was changed. When you initiate **Inhibit** or **Disable in Power Flow** actions, a dialog box will open allowing you to enter a comment; for **Manual Override**, a **Comment** field is available below the **Value** field. The comment text, user, and date and time the comment was entered will be added to the selected device's SCADA Summary row.

Existing comments may be edited by selecting the SCADA Summary row and selecting **Edit Comment...** from the **Actions** menu.

Disabling/Enabling Measurements in the Power Flow Solution

If you see anomalies in the SCADA data (for example, due to mapping issues, transducer issues, or temporal issues, and so on) where SCADA values seem potentially unhelpful in allowing PFService to solve, you can disable the suspected measurements from taking part in the power flow solution by doing the following:

1. Select the suspected measurements in the SCADA Summary.
2. Click the **Disable in Power Flow** button from the Actions menu or the right-click option menu. The Quality column value will be set to **S** for the selected measurements.

To re-enable the disabled measurements:

1. Select the disabled measurements from the SCADA Summary Tool
2. Click the **Enable in Power Flow** button from the Actions menu or right-click context menu. The Quality column value will be changed from **S** to blank for the selected measurements.

SCADA Measurements Trend Graph

Menus and Toolbar Buttons

File Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshes the data in the Trend Graph window with the selected control zone's data.	
Print...	Prints the trend graph for the selected region.	
Pin	Click to pin the graph, which will open new graphs in separate windows. If a graph is not pinned, then when the Trend Graph option is selected again, the current window will display the data for the new selection. **Note:** You may pin multiple graphs.	
Exit	Closes the Trend Graph window.	--

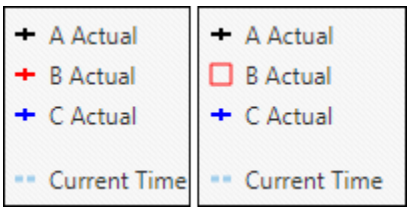
Help Menu

Menu Option	Description	Toolbar Icon
Graph Tool Help...	Opens the online help system to the Trend Graph help content.	--

The graph will show the predicted values and the actual measurements over the given period of time. If a measurement is done for an attribute that has multiple phases, all of the phases will be shown on the graph.

The start and end dates can be changed by selecting a date and time in the **Begin Date** and **End Date** fields.

Lines can be hidden by deselecting the symbol in the legend:



If you hover the mouse over a point on the graph, the details of the measurement will be shown.

Choosing the Analog Measurements to Display in the Viewer

An Administration user type may choose which measurement types (for example, Amps A|B|C, kV A|B|C, kW, etc.) to display in the Viewer for a particular device.

> **Note:** Users must have **Measurements** selected in the Viewer Hide/ Display dialog box to see any measurements.

To add or remove a measurement type for a device, first load the Viewer map containing the device, then select the SCADA summary row for the device measurement type, right-click, and choose one of the following options:

- **Show Measurement in Viewer:** Shows the selected measurement in the Viewer.
- **Hide Measurement in Viewer:** Hides a measurement in the Viewer.

Understanding SCADA Information in the Viewer

Oracle Utilities Network Management System SCADA Extensions provides SCADA information in the Viewer in several different ways. The following table describes how SCADA information may appear in the Viewer (depending on your system's configuration).

Data	Description
Switch Status	Switch status information (that is, open or closed) received from SCADA is dynamically updated in the Viewer. Status symbology is no different than that for typical devices, except that it is based on data received automatically from a SCADA measurement rather than user input.
Digital Measurements	Digital measurements (for example, tap position, auto reclose suppression, ground fault) received from SCADA are dynamically updated. These measurements are displayed as a letter code or symbol next to the SCADA device. Several digital measurement indicators may be listed.
Analog Measurements	Analog measurements received from SCADA are dynamically updated. These measurements are displayed in the Viewer next to the associated SCADA device. Several unique measurements can be listed. When a new measurement is received, it replaces the current measurement.

Quality Codes	Quality codes provide additional information about the quality of the measurement coming from the SCADA device (for example, out of scan, inhibited, manual override). A quality code is displayed as a letter code following a symbol or measurement. **Quality Code Values:** • I: inhibited • M: manually entered/overridden value • H: high limit violation • L: low limit violation For example, SCADA Breaker with IM indicators on the manually entered values for Auto Recloser attribute (off) and temperature (125.00 F).

Enabling/Disabling SCADA Measurements in the Viewer

You can enable or disable SCADA measurements in the Viewer using the Hide / Display dialog box.

> **Note**: To access the Hide/Display dialog box in the Viewer, see **Hiding and Displaying Viewer Objects** on page 2-79.

The system displays a flag (S) to indicate that a device has available SCADA measurements.

Choosing the SCADA Information Display

It is possible to change the how the SCADA measurements are displayed for a selected device. Any changes will affect the display for any user that has measures turned on.

To change the position of the measures for an asset device, right click the measures, which will display a popup with the following choices:

- **device alias:** Focuses the Viewer on the device associated with the measurements.
- **Move:** Allows you to move the measurements and digital measurement symbols to a new location. Choose **Move**, then drag the rectangle box surrounding the measurements to your desired location. Administrators can move the location for all users. Non-administrators only affect the location in the current loaded map for the user, and do not affect other users.
- **Show Leader Line:** This displays a leader line from the device to the measurement. (Administration users only.)
- **Hide Leader Line:** This hides the leader line. (Administration users only.)
- **Rotate Clockwise:** Rotates the measures clockwise. (Administration users only.)
- **Rotate Counterclockwise:** Rotates the measure counterclockwise. (Administration users only.)
- **Resize Bigger:** Increases the size of the measurements. (Administration users only.)
- **Resize Smaller:** Decreases the size of the measurements. (Administration users only.)

Displaying SCADA Measurements with Device Details

If you select a SCADA device in the Viewer, the Device Details balloon displays a SCADA tab that lists the SCADA measurements for the selected device.

- The **Attribute** column contains a description of the measurement type, as configured in the ATTRIBUTES.description column in the Oracle Utilities Network Management System database for the matching attribute.
- The **Value** column contains the last reported measurement value. The value can be status, digital, or analog. For status measurements, the values are displayed as a test pair, such as open/close, on/off, and so on. Analog and digital values are shown as floating point and integer values.
- The **Quality** column contains the Quality codes for the measurement that indicates the quality of the SCADA measurement (for example, out of scan, inhibited, manual override). Several quality codes can be listed.
- The **Source** column contains the source for the measurement, as configured in the ANALOG_MEASUREMENTS.source or DIGITAL_MEASUREMENTS.source column in the Oracle Utilities Network Management System database.

Remote SCADA Operation Warnings

When you perform a remote SCADA device operation in a two-way system, Oracle Utilities Network Management System SCADA Extensions will run certain checks. There are three warnings that you might receive as a result of these checks.

> **Note:** The Oracle Utilities Network Management System SCADA ICCP Block 1, 2, and 5 Adapter controls are limited to switch status direct operate request.

The following table describes the possible remote SCADA operations warnings.

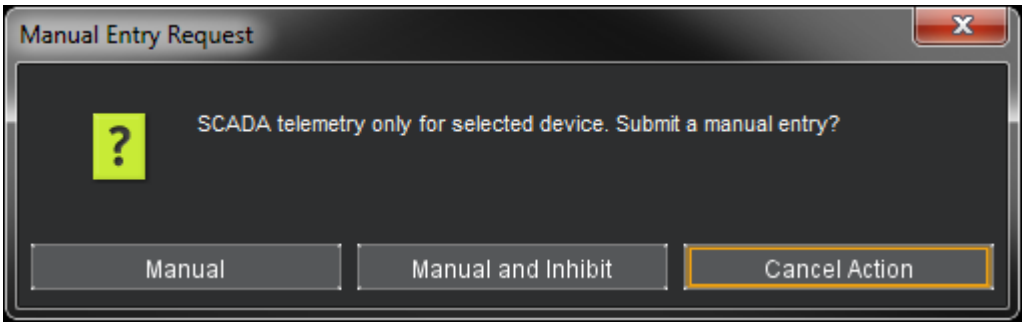
Warning	Description
SCADA Confirmation	When you open or close a SCADA-controlled device, the Look Ahead window opens providing information about the potential results of the operation (see **Using the Look Ahead Dialog Box** on page 2-122). After you view all the required information and choose to proceed, another message box opens, reminding you that a remote operation will take place and asking you to confirm the SCADA-controlled operation.
SCADA Control Action Time-Out	Once you have confirmed that you want to perform a SCADA-controlled device operation, Oracle Utilities Network Management System SCADA Extensions starts a timer. This timer monitors the response to the operation, expecting a "change-of-state" of the device (for example, open to close). If a change-of-state is not detected from the device before a time-out occurs, Oracle Utilities Network Management System SCADA Extensions generates an alarm displayed in the Alarms List.
SCADA Error	If errors are detected between Oracle Utilities Network Management System and the SCADA interface, a message box opens informing you of the failed operation. You should report these errors to the system administrator or support personnel.

> **Note:** If you click **Cancel** in the Look Ahead window, Oracle Utilities Network Management System SCADA Extensions will not initiate the remote SCADA operation.

Using SCADA Control Tool Features

If your system has a one-way SCADA interface, you can only receive information about SCADA measurements. If it has a two-way SCADA interface, however, not only can you receive information, but you can also remotely control SCADA devices. The Oracle Utilities Network Management System SCADA ICCP Block 1, 2, and 5 Adapter remote control is limited to direct operate request of switch status.

Use the Control Tool to perform operations on SCADA devices in the same manner as you would on non-SCADA devices (see **Operating Devices** on page 2-107). When you accept the operation in the Look Ahead tool, the system will open the SCADA Manual Entry Request dialog box that allows you to submit a manual entry, submit the manual entry and inhibit further SCADA updates, or cancel the action. If the measurement is already inhibited, the dialog box will offer a **Manual and Un-Inhibit** option.



Note: If the inhibit state is configured for comments, then the Manual and Inhibit option will display a dialog box asking you to enter a comment before you may perform the inhibit action. The comment will be displayed in the SCADA Summary window. For more information, see **Adding and Modifying Comments for SCADA Status Changes** on page 10-22.

Switching Management SCADA Integration

If you have a two-way SCADA system, you can operate devices as a step when completing a switching plan. Just like a typical switching plan, you can open or close devices by selecting the switching step and clicking the **Complete** button. (See **Issuing a Switching Sheet** on page 11-59.) With a two-way SCADA system, however, the actual devices will be remotely operated. The Oracle Utilities Network Management System SCADA ICCP Block 1, 2, and 5 Adapter controls are limited to switch status.

For two-way SCADA, any instructed SCADA action will produce the SCADA Control Request dialog box asking if you would like to submit the request to SCADA or not. Clicking **Yes** will submit the request to SCADA while selecting **No** will not submit the request. Both options will cause a switching step to be placed into the SCADA Pending state. This is true whether the instruct action is initiated from the Control Tool or from Web Switching. The device will also receive an Instruct condition. NMS will listen for SCADA telemetry and mark the action (step) as Completed once the action has been reported as being completed by SCADA. If SCADA does not report back a successful completion of the action, then the step will remain in the SCADA Pending state.

At any time, you may also choose to manually operate the SCADA device locally without sending the action to SCADA. This is accomplished by selecting the non-instructed version of the action from the Control Tool or by clicking the **Complete** button for a step selected in Web Switching. When these non-instructed actions are initiated, a Manual Entry Request dialog box will ask you to select the **Manual**, **Manual and Inhibit**, or **Cancel** button options. Both the **Manual** and **Manual and Inhibit** options result in the recording or setting of a switching sheet step to the Completed state. The device is also updated in the viewer.

If a SCADA action related step is in the SCADA Pending state, you can force the completion of the action prior to receiving any updates from SCADA by completing the instructed action from the Control Tool or from Web Switching. In this case, you will again get the Manual Entry Request dialog box with options for **Manual**, **Manual and Inhibit**, or **Cancel**. Selecting either of the Manual options will force the step to the Completed state and will update the device within NMS. This does not send a cancel request or any other type of message to SCADA. The Instruct condition will also be removed from the device.

If any errors occur, Oracle Utilities Network Management System SCADA Extensions generates an alarm displayed in the **Alarms** list (see **Understanding the Alarms List** on page 2-138).

Vendor-Specific SCADA Integrations

OSI SCADA Integration

Cross UI Navigation

This functionality allows a more seamless user experience when using these two client-side applications. Specific windows can be navigated to from either application (OSI OpenView or NMS) with context regarding a specific point ID or substation.

NMS to OSI

This functionality allows specific windows (Trending or ViewPoint) in OSI OpenView to be opened from the **Navigate to SCADA** menu option available from the SCADA Summary's **Actions** menu or a selected row's right-click context menu.

Point Trend

Selecting **Point Trend...** from the **Navigate To SCADA** menu causes a new Trending window to open in the OSI OpenView application with the selected point from the NMS SCADA Summary row automatically added.

Point Alarms

When you select **Point Alarms...** from the **Navigate To SCADA** menu, the OSI ViewPoint alarm list is filtered for the specific common point ID selected in the NMS SCADA Summary.

Substation Alarms

When you select **Substation Alarms...** from the **Navigate To SCADA** menu, the OSI ViewPoint alarm list is filtered for all alarms associated with the substation for the specific common point ID selected in the NMS SCADA Summary.

Point Summary

When you select **Point Summary...** from the **Navigate To SCADA** menu, the OSI Analog Summary or Status Summary window opens with the row associated with the specific common point ID selected in the NMS SCADA Summary highlighted.

Point Details

When you select **Substation Alarms...** from the **Navigate To SCADA** menu, the OSI Analog Details or Status Details window displays with the row associated with the specific common point ID selected in the NMS SCADA Summary highlighted.

OSI to NMS

Similarly, you can navigate to certain views for a point in Oracle's NMS when you right-click a relevant common point ID in an OSI OpenView tabular view.

NMS - View in Viewer

When you select **NMS - View in Viewer**, the NMS Viewer 1 opens with focus on the device associated with the specific common point ID selected or referenced in the OSI ViewPoint window.

NMS - View in SCADA Summary

When you select **NMS - View in SCADA Summary**, the NMS SCADA Summary is opened and populated based on the device associated with the specific common point ID selected or referenced in the OSI ViewPoint window. The specific SCADA Summary row corresponding to the selected point in OSI ViewPoint will be highlighted.

Chapter 11

Web Switching Management

This chapter describes Oracle Utilities Network Management System Web Switching Management. It includes the following topics:

- Overview
- Understanding Web Switching Management Windows
- Planned Switching
- Emergency Switching
- Understanding the Switching Sheet List
- Event Associations
- Crew Assignments
- Working with Safety Documents
- Outage Correction
- Using the Miscellaneous Log
- Viewing Global Overlaps
- Web Safety

Overview

Web Switching Management allows you to create and implement switching sheets and safety documents. Switching Sheets allow you to track proposed switching actions, analyze the results, and implement the plan. Safety Documents provide an electronic representation of paper safety documents, which are used for switching operations to record the issuance and release of tags on devices.

Web Switching Management's full feature set is available through the Web Workspace environment for a **Full Operations plus Web Switching** user type (see Understanding User Types). **Web Switching Request** provides the Switching Request user type with a subset of the Web Switching Management tools related to creating and editing switching requests.

Operating Modes

Web Workspace supports two operating modes:

- **Real-Time Mode** - Allows you to make real-time changes to the state of devices in the system. When you create an emergency switching sheet, the system automatically enables real-time mode. For planned sheets, you can switch to this mode when the sheet is ready to be worked.
- **Study Mode** - Allows you to make changes without affecting real-time data. You can apply the actions to the steps, but the actions are not applied to the real-time data. This mode is valid for all types of sheets. Study mode is the only valid mode for template and outage correction switching sheets.

Device Associations with Nominal and Current Network Components

In switching plans and safety documents, as switching operations proceed, devices may become associated with feeders or substations other than the ones defined in the as-built model. These associations will be called out in fields defined as **Current Feeder/ Current Substation** and there will be corresponding **Nominal Feeder/Current Substation** fields that will list the feeder or substation that the device is normally associated with.

In **Switching Sheets**, these fields will dynamically update when the following actions occur:

- When a user loads the sheet and it is in the **Approved**, **Scheduled**, **Issued**, **In Progress**, **In Progress (Instructed)** states.
- When the sheet is loaded and a change is made to the current network that results in any device on the **Request** tab or the **Steps** list getting a new current feeder or substation value. The sheet has to be loaded within a client environment for this to work. Again, this is only when the sheet is in the previously mentioned states.
- When a user has permissions to manually save the switching sheet. If the **Save** button is enabled, then the **Current Feeder** and **Current Substation** values will be updated when the sheet is saved.

  Note: The sheet states and actions are described later in this guide.

In **Web Safety** documents, these fields will dynamically update when the following actions occur:

- When a user loads the parent sheet and the safety document is in the **New**, **Issued**, **Released**, or **Unissued** state.
- When the parent sheet is loaded and a change is made to the current network that results in any device on the safety document getting a new current feeder or substation value. The sheet has to be loaded within a client environment for this to work. Again, this is only when the safety document is in the previously mentioned states.
- When a user has permissions to manually save the safety document. If the **Save** button is enabled, then the **Current Feeder** and **Current Substation** values will be updated when the sheet is saved.

  Note: The safety document states and actions are described later in this guide.

Understanding Web Switching Management Windows

Overview

This section provides an overview of Switching Sheet windows. The standard configuration opens a switching sheet in the lower right quadrant of the workspace, but it may be moved anywhere within the workspace or maximized to the full workspace dimensions.

Each open switching sheet has its own tabbed window, which is labeled with a combination of the switching sheet type, number, and feeder ID, if the feeder field is populated. Multiple switching sheets are typically docked together and displayed as a tab group.

> **Note:** Double-click any tab (or the empty area to the right of the tabs) to maximize the tab group; double-click again to restore the size.

Right-click the switching sheet tabs to access the context menu, which provides the following options:

- **Maximize:** maximizes the sheet window.
- **Restore:** restores the maximized window to its original size and position.
- **New Tab Group:** displays the sheet separately.
- **Collapse Tab Groups:** regroups separate windows into tab groups.
- **Windows...:** opens a dialog box that lists all open sheets, which you can then:
  - Activate (that is, bring to front in a tab group) a single sheet.
  - Close selected sheets.
- **Close:** closes the sheet.
- **Close All:** closes all open sheets.
- **Close Others:** closes all open sheets except the sheet that was right-clicked.

Web Switching Sheets

Switching Sheet Types

Web Switching Management supports the following types of switching sheets.

- **Planned** - Used for switching sequences that are prepared ahead of time. In scheduled or planned switching, you can create, study, and approve switching steps in a Viewer in study mode prior to completing them in real-time. Planned switching sheets require information that is not needed for emergency switching sheets, such as a start and end date.

  Note: When creating a switching sheet from an event in the Work Agenda or Event Details, the *Planned* switching sheet type is not available.

- **Emergency** - Used for switching sequences that are prepared and implemented in real-time when overloads or unplanned outages occur.

  Notes:

  - Emergency Switching Sheets cannot be created from Web Switching Request.

- **FLISR** sheet types are created by the FLISR tool and are another form of an Emergency switching sheet. Users cannot create FLISR switching sheets from scratch. In automatic mode, FLISR can create and execute a switch plan without operator intervention. See **Executing FLISR in Automatic Mode** on page 18-14. In manual mode, you generate and then execute the switch plan manually. See **Generating a Switch Plan with FLISR in Manual Mode** on page 18-16.

- **Optimization** - Optimization sheets are created by Network Optimization module. See **Using Optimization in Real-Time Mode** on page 14-5.

- **Load Shed** - Load Shed sheets are created by the Load Shed and Restoration tool. See **Using the Load Shed and Restoration Tool** on page 15-6.

- **Template** - Used to record and store frequently performed switching step sequences that can be copied into a switching plan. A template is not used to perform actions, but rather to create and save "pre-built" sheets with step sequences. You can create a template from scratch or by copying an existing template, planned, or emergency switching sheet.

  Note: When creating a switching sheet from an event in the Work Agenda or Event Details, the *Template* switching sheet type is not available.

- **ANMS Template** - Used to create ANMS scheme templates.

- **Outage Correction** - Used to correct outage information. Outage events are associated to this switching sheet type and then steps are recorded to reflect the actual events leading up to the outage. An option on the sheet then allows you to update the associated event, including customer counts associated to the outage.

  Note: Outage Correction switching sheets cannot be created from Web Switching Request.

Additional or alternative sheet types can be configured for your project; see the *Oracle Utilities Network Management System Configuration Guide* for details on creating custom sheet types.

Switching Sheet States

A switching sheet passes through different phases during the creation and completion of the sheet. These phases are represented by "states" that follow a logical sequence and determine what you can do with a switching sheet at any time. Each sheet type has a unique set of state transitions. For example, planned switching sheets have more state transitions than emergency sheets.

Normal Progression of Planned Sheet	Normal Progression of Emergency Sheet
1. New 2. Requested 3. Prepared 4. Checked 5. Approved (optional) 6. Scheduled 7. Issued 8. In Progress 9. Completed	1. New 2. In Progress 3. Completed

See **Changing the Switching Sheet State** on page 11-23 for a complete description of each possible state and instructions for changing the sheet state.

Note: The state of the switching sheet should not be confused with the state of individual switching steps within the switching plan, which may also progress through a series of states. See **Switching Sheet Step States** on page 11-41.

Switching Sheet Window Components

- Menu and Toolbar Features
- Switching Sheet Tabs
- Status Bar

Menu and Toolbar Features

File Menu

The table below describes the options available on the **File** menu.

Menu Option	Description	Toolbar Icon
Save Sheet	Saves the switching sheet.	
Copy As...	Opens the Copy Switching Sheet As dialog box that allows you to copy the current sheet into a newly created sheet. The new sheet can be one of the following types: Planned, Emergency, Template, or Outage Correction. See **Copying a Switching Sheet** on page 11-85 for details.	--
Print Preview...	Opens the Switching Report Content Selection dialog box that allows you to choose the criteria for previewing a switching report.	
Print...	Opens the Switching Report Content Selection dialog box that allows you to choose the criteria for printing a switching report.	
Email...	Opens the Switching Report Content Selection dialog box that allows you to choose the criteria for emailing a switching report.	
Export...	Export the switching sheet as a JavaScript Object Notation (JSON) text file to your local file system. This file can then be imported into NMS as an Administration or Trainer user type from the Switching Sheet List. See **Exporting/Importing Switching Sheets** on page 11-100 for details.	--
Toggle Dockable Window	Dock or undock the window into the NMS environment window. The tool will be docked where it was last docked. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for information.	--
Exit	Closes the active switching sheet.	--

Actions Menu

The options available in the Actions menu are dependent on the sheet type. Actions available will typically also be available through the right-click context menu and/or toolbar. The following are always in the **Actions** menu

Option	Description	Tab	Toolbar Button
Check In/ Create New Version	The **Check In** button allows you to check in and save a copy of the switching sheet. This is used for auditing purposes to determine differences between steps in two versions of a switching sheet. When you check in a sheet, this button changes to Create New Version, which manually increments the sheet's version number and sets the sheet to Editing mode. See **Working with Switching Sheet Versions** on page 11-65 for more information.	All	
Edit Mode/ View-Only Mode	**Edit and View-Only Modes** When the sheet is in Edit mode, you are the only user who can edit it. When it is in View-Only mode, you cannot edit the sheet and it is available for editing by other users. The **Edit/View-Only Indicator** button toggles the sheet between Edit and View-Only modes. When you open a sheet for editing, the sheet is automatically placed into Edit mode and blocks other users from editing it. If you open a sheet that is currently being edited by another user, you are not allowed to make any changes.	All	
Refresh	Refreshes the data in a view-only sheet. The Refresh option is available when another user has locked and edited the sheet.	All	
Update Device-Related Fields	Updates the Substations and Feeders fields with values related to the switching sheet's device and step device values. The Location and Voltage values will be updated with values related to the sheet's device value. If the sheet's device value is invalid or empty and the steps have no device related operations, then the fields will be cleared when this option is selected.	Request	
Insert Blank Step	Inserts a blank step below the current step row.	Steps	
Place Step Insertion Indicator	Adds a step insertion indicator icon to the row.	Steps	

Option	Description	Tab	Toolbar Button
Remove Step Insertion Indicator	Removes the step insertion icon.	Steps	
Link to Safety Document	Links the selected safety document to the currently selected step in switching sheet. This option is only visible when the switching sheet has active safety documents linked to it.	Steps	
Remove Links to Safety Documents	Disassociates the safety document that is linked to the step and updates the step.	Steps	
Add New Block Header	Isolate Fault Location Maintenance Restore Construction Custom...	Steps	
Rename Block Header	Isolate Fault Location Maintenance Restore Construction Custom...	Steps	
Load Safety Documents...	Display the safety documents linked to the highlighted steps.	Steps	
Clear Planned Time	Clear the Planned Date values for the highlighted steps. This option is only visible when at least one of the highlighted steps has an Planned Date value.	Steps	
Update Step Control Zone Data	Iterate through the selected steps and update their control zone related data. This may be required if the step's device has been recently moved to a new control zone.	Steps	
Update Operation Step Details	Recalculate all step details based on the current step order and the current study model. This is available when in study mode only.	Steps	
Clear Crews	Clear the Instructed To values for the highlighted steps. This option is only visible when at least one of the highlighted steps has an Instructed To value.	Steps	

Option	Description	Tab	Toolbar Button
Model Verify	This action is available if model changes have occurred that impact one or more devices in the switching sheet. The Web Switching service checks all the opened switching sheet steps after a model edit has occurred. If a step has a device that matches a device that was directly impacted by a model change, that step will be marked as needing verification. When the sheet is displayed, these steps will be highlighted in yellow. You can either check off each step in the sheet as they are verified or check off the entire sheet. **Notes:** • Outage Correction sheets are not included in this processing. Outage Correction validates the devices when the correction is made. • While the sheet has verifications pending, step executions cannot be performed within the sheet. • Switching sheets in the Completed or Rework states are not included in this processing.	Steps	
Move Crew	Move a crew to the device associated with the selected step. This option is enabled when a single highlighted step is instructed to an en-route crew.	Steps	
Clear Condition Indexes	Removes the condition class and index associated to the selected step. An error dialog box will be displayed if the selected steps' condition handles cannot be cleared. The action is only available for steps that are not in a terminal state and that are not associated to safety documents.	Steps	
Update Instructed Dates...	Opens the **Update Instructed Date** dialog box, which allows you to enter a new Instructed Date for selected steps. Steps that have not been instructed will not be updated.	Steps	

Option	Description	Tab	Toolbar Button
Move Steps to Misc Log	This action moves Real Time Completed, Aborted, Failed or Instructed steps to the Miscellaneous Log. SCADA Pending steps cannot be moved until they have transitioned to one of the states already stated. Steps associated to safety documents are also not allowed to be moved. Any step in a New or Uninstructed state will not be moved as the Miscellaneous Log only displays Real Time steps that are in a terminal or Instructed state. Any attempt to move an immovable step will result in an error dialog box and the steps will not be moved from the switching sheet's steps list. To move steps to the Miscellaneous Log, select one or more steps and select **Move Steps to Misc Log** from the Actions menu or from the right-click context menu.	Steps	
Group Steps	Groups two or more contiguously selected steps.	Steps	
Ungroup Steps	Ungroups steps that have been grouped.	Steps	
Reset Operation Text...	Resets the text in the Operation field to its calculated value following a manual edit. This option is only visible once the step's Operation field has been manually edited. This is not possible for all types of steps and with Product configuration this is limited to non-operational steps. In other words, any step that does not actually impact the model, manipulate a condition, or interact with any other tools in the environment.	Steps	
Clear Clipboard	Clears copied steps from your computer clipboard. Alternatively, press the Escape (**Esc**) key.	Steps	
Feeder Load Management...	Launches Feeder Load Management for the feeders associated to the currently highlighted steps. This option is also available on the right-click option menu in the Steps table. This option is only available when Power Flow and FLM are both licensed and configured.	Steps	

Option	Description	Tab	Toolbar Button
Power Flow Analysis	**Submenu Options** • **Run…:** This action brings up the power flow wizard to perform power flow analysis. See **Power Flow Analysis in Switching Management** on page 11-87 for more details. • **View Results…:** This action brings up the Power Flow Analysis details dialog box. • **Update Results:** This action updates the Power Flow Analysis using the same parameters used to run the last analysis. • **Clear Results:** This action clears the Power Flow Analysis results of the plan. **Notes:** • View, Update and Clear options are enabled only if a sheet has power flow results. • Power Flow Analysis button is enabled only for planned sheets provided power flow is licensed. • View Only users can view only the power flow results. No other option is enabled. • The menu options, tool bar buttons, power flow columns are not displayed for Switching Request users.	Steps	

Help Menu

Option	Description	Toolbar Button
Web Switching Management Help	Opens online help content for the switching sheet's active tab. For example, if the Request tab is active, the "Completing the Request Tab" will be returned.	--
About Web Switching Management	Opens a window with environment and software information.	--

Switching Sheet Tabs

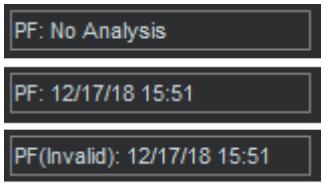
Each switching sheet tab displays a row of tabs that you can use to view and edit all of the information associated with the sheet. Some tabs, like the Steps tab, have their own toolbar with shortcuts for supported actions.

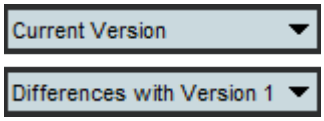
The following table describes the tabs displayed for each switching sheet.

Tab	Description
Request	Use this to view and enter information about the user who requested the switching sheet, including phone number and contact, the sheet's owner, charge number, start and finish dates, feeder and voltage information. See **Completing the Request Tab** on page 11-20.
Steps	Use this to view, add, and edit switching steps. See **Adding and Editing Steps** on page 11-28.
Impacted Customers	Use this to view, print, email, and maintain the list of impacted customers. See **Viewing Impacted Customers** on page 11-67.
Overlaps	Use this view to identify overlaps that the sheet may have with other sheets in the system. The search criteria can include date/time, control zone, and affected devices. See **Checking for Overlaps** on page 11-72.
External Documents	Use this to attach external documents to the switching sheet. See **Adding External Documents to a Switching Sheet** on page 11-78.
View Areas	Use this to save and reload viewing areas from a Viewer window. See **Saving and Loading View Areas** on page 11-75.
Safety Documents	Use this to view, load, and delete safety documents that have been defined for this sheet. See **Working with Safety Documents** on page 11-102.
Tracking/Audit Log	Use this to view audit log entries associated with this sheet. See **Viewing the Audit Log** on page 11-77. You can also use this to view the current sheet state or transition to another state. See **Changing the Switching Sheet State** on page 11-23.

Status Bar

The switching sheet status bar provides several indicators about the switching sheet and related system status.

Status Bar Indicator	Description
Mode Indicator 	Indicates the current operating mode: • **Study Mode:** Allows you to complete switching operations without affecting the real-time data model. You can apply the actions to the steps, but the actions are not applied to the real-time data. • **Real-Time Mode:** Allows you to apply real-time changes to the state of devices in the data model.
	PF Indicator: Power Flow Indicator shows the status of power flow analysis for the plan. The status can be one of the following: 1. PF: No Analysis. This status is shown when the plan does not have power flow analysis results or the results are cleared out. 2. PF: Date and Time the last analysis was run. This status is shown when the plan has a valid power flow results. 3. PF (Invalid): Date and Time the last analysis was run. This status is shown when the last power flow analysis results are invalidated by changing the plan. **Note:** The power flow indicator is only displayed for planned switching sheets.
Overlap Indicator 	Indicates whether the switching sheet will result in overlap of affected devices or control zones during the same time period. This icon will only be displayed when overlaps exist. Overlaps are determined when you click **Update Overlaps** on the **Overlaps** tab. See **Checking for Overlaps** on page 11-72 for more information.
Impacted Customer Indicator 	Indicates whether the switching operations will impact customers. This icon will only be displayed when customers are impacted by the switching sheet. Impacted Customers are determined when you select the Rebuild button on the Impacted Customers tab. See **Viewing Impacted Customers** on page 11-67 for more information.

Status Bar Indicator	Description
Recording Indicator 	Indicates whether recording is turned on, paused, or turned off. • When recording is on, you can add steps by taking actions in the Viewer with the Control Tool. • **Recording Currently Paused** is displayed if recording is on for the sheet, but another sheet or step recording tool has focus and is actively recording. For example, you are recording steps in a planned switching sheet, but you open Event Details for another event and record some actions on the Event Details **Steps** tab; while recording is on for Event Details, the planned switching sheet will display **Recording Currently Paused**.
Version Indicator (Text)	Indicates the switching sheet version and whether or not your latest changes have been checked in. See **Working with Switching Sheet Versions** on page 11-65 for more information.
Version Menu 	Indicates the version currently displayed and allows you to select a previous version to compare against the current version. See **Working with Switching Sheet Versions** on page 11-65 for more information.
Edit/View-Only Indicator : Edit mode : View-Only mode	**Edit and View-Only Modes** When the sheet is in Edit mode, you are the only user who can edit it. When it is in View-Only mode, you cannot edit the sheet and it is available for editing by other users. The **Edit/View-Only Indicator** button toggles the sheet between Edit and View-Only modes. When you open a sheet for editing, the sheet is automatically placed into Edit mode and blocks other users from editing it. If you open a sheet that is currently being edited by another user, you are not allowed to make any changes. You can override the lockout by stealing the other user's lock over the switching sheet. See **Opening Locked Documents** on page 11-97 for more details.

Planned Switching

The sections that follow describe how to create and manage planned switching sheets. Planned switching sheets are used for switching sequences that are prepared ahead of time. In scheduled or planned switching, you can create, study, and approve switching steps in a Viewer in study mode prior to completing them in real-time mode.

This section contains the following topics:

- Creating a Planned Switching Sheet
- Switching Sheet Requests
- Changing the Switching Sheet State
- Adding and Editing Steps
- Reviewing a Switching Sheet in Study Mode
- Replaying Steps
- Implementing a Planned Switching Sheet
  - Scheduling a Planned Master Event
  - Issuing a Switching Sheet (includes associating a crew and printing the sheet)
  - Instructing and Completing Switching Sheet Steps
  - Moving a Crew
- Working with Switching Sheet Versions
- Viewing Impacted Customers
- Checking for Overlaps
- Saving and Loading View Areas
- Emailing Switching Sheet Data
- Adding External Documents to a Switching Sheet
- Viewing the Audit Log
- Opening an Existing Switching Sheet
- Copying a Switching Sheet
- Deleting a Switching Sheet
- Power Flow Analysis in Switching Management

For information about emergency switching sheets, see **Emergency Switching** on page 11-90.

Creating a Planned Switching Sheet

You can create a new planned switching sheet by doing one of the following:

- Select **New** and then **Switching Sheet...** from the Web Workspace **File** menu.
- Click the new switching sheet button ( ) on the Web Workspace toolbar.
- From a device's Control Tool, select **Switching Plans...** and then select **Create Planned Switching Sheet...** to create a new switching sheet.
- From the Switching Sheet List, select **New...** from the **File** menu.

The New Switching Sheet window is displayed.

When a Planned switching sheet is created that results in the sheet being associated to a device, then all device related attribute fields on the **Request** tab will be populated.

Using the New Switching Sheet Window

Use the New Switching Sheet window to create switching sheets. This window contains the following fields and buttons:

- The **Type** column displays the types of switching sheets you can create. Planned, Emergency, and Template are the base types.
- The **Description** column displays a description of the sheet type.

The **Pre-Created Switching Sheets** section displays a list of all existing switching sheets. It displays the following columns:

- **Status** displays the switching sheet state, such as New or Requested.
- **Type** displays the sheet type, such as Planned, Emergency, or Template.
- **Sheet #** is the number of the switching sheet. This number is automatically assigned by the system when the sheet is created.
- **User** is the ID of the user who created the sheet.
- **Feeders** are the feeders associated with the sheet (as displayed on the Request tab).
- **Device** is the device associated with the sheet (as displayed on the Request tab).
- **Substations** are the substations associated with the sheet (as displayed on the Request tab).
- **Completed Date** is the completion date for the sheet.
- **Description** is the description of the sheet (as displayed on the Request tab).
- The **Create** button creates a new switching sheet of the selected type.
- The **Create a Copy** button creates a copy of the switching sheet selected in the **Pre-Created Switching Sheets** list. This button is not enabled unless a switching sheet and a sheet type are selected.

See Also:

- Creating a Planned Switching Sheet from the New Switch Sheet Window
- Filtering the Switching Sheet List
- Sorting the Switching Sheet List

- Creating a Switching Sheet Template
- Creating a Switching Sheet from a Template

Creating a Planned Switching Sheet from the New Switch Sheet Window

Follow these steps to create a planned switching sheet from the New Switching Sheet window:

- To create a new switching sheet from scratch, select **Planned** from the Switching Sheet Types section, and then click **Create**.
- To create a copy of an existing sheet, do the following:

1. Select the sheet you want to copy from the Pre-Created Switching Sheets list.
2. Select **Planned** from the Switching Sheet Types list.
3. Click **Create a Copy**. (To search for a particular sheet, see **Filtering the Switching Sheet List** on page 11-18.)

   Notes:
   You can create a new sheet based on a sheet of a different type. For example, you can create a planned sheet based on an emergency sheet or create a template based on a planned sheet.

   Although most fields are copied to the new sheet, some fields (such as Audit Log entries and step completion information) are cleared in the new sheet. If you copy a switching sheet that has one or more safety documents, copies of the safety documents are included with the new sheet.

Filtering the Switching Sheet List

Use the filter boxes at the top of each column to filter the list. Type all or part of the text you want to filter by. For example, to see only Planned sheets, enter `Plan` in the **Type** filter box. The list is filtered to display only sheets where the Type column contains the characters "Plan." You can combine filter criteria by typing values in more than one column. As you type in each filter box, the list is filtered immediately based on entries in all boxes.

Sorting the Switching Sheet List

You can sort the list by clicking on a column header. A or icon indicates the column is being sorted in ascending or descending order, respectively.

Understanding Switching Sheet Templates

Switching templates look like standard switching sheets, but they are used for creating and saving sheets that contain common information that is used repeatedly. The information may include:

- File attachments, which may be templates of other forms such as Excel Spreadsheets.
- Safety Documents
- View Areas.
- Pre-filled Request Tab Information.

Once you save the template, you can create a copy of it, and then edit the copy as needed. You can also copy individual steps from a template and paste them into another switching sheet. Templates can save you considerable time and effort when you are working with frequently performed switching sequences.

Creating a Switching Sheet Template

To create a template, do the following.

1. From the **File** menu, select **New**, and then select **Switching Sheet...** The New Switching Sheet window is displayed.
2. From the Switching Sheet Types section at the top of the window, select **Template**.
3. Do one of the following:
    - To create a new, blank template, click **Create**.
    - To create a template based on an existing sheet, select the sheet you want to copy from the Pre-Created Switching Sheets list, and then click **Create a Copy**. To search for a particular sheet, see **Filtering the Switching Sheet List** on page 11-18.

    Note: Although most fields are copied to the new sheet, some fields (such as Audit Log entries and step completion information) are cleared in the new sheet.

Understanding the Template ID Field

The **Template ID** field, which is only editable by **Administration** users, uniquely identifies the template when creating a copy.

> **Note:** The **Template ID** field value is used when creating a new switching sheet from within the Operations Mobile Application.

When an **Administration** user enters a value in the **Template ID** field, the system checks whether there is another template sheet with the same value; if so, then an error dialog box is displayed and the entered value is not allowed.

Creating a Switching Sheet from a Template

After a switching template has been created and saved, you can use the template as the basis for another switching sheet.

To create a new planned sheet from a template:

1. From the **File** menu, select **New**, and then select **Switching Sheet...** The New Switching Sheet window is displayed.
2. From the Switching Sheet Types section at the top of the window, select **Planned**.
3. From the Pre-Created Switching Sheets list, select the template to use.
4. Click **Create a Copy**.
5. Edit the sheet as needed (see the instructions in the remainder of this guide) and save when you are done.

Switching Sheet Requests

Someone other than the person who prepares the switching sheet usually initiates switching sheet requests. The requester may be someone in the construction/ maintenance department, while the preparer is typically an operations user assigned to look for and prepare new requests. Typically, the requester is a Switching Request user type.

Capabilities of the Switching Request User Type

Switching Request users do not have full access to all switching sheet information and operations. Specifically, Switching Request users are limited to the following capabilities:

- Creating and viewing Planned switching sheets only. All other types of switching sheets are not available to Switching Request users.
- Creating copies of existing switching sheets.
- Loading, printing, and emailing existing sheets. Only the information contained in the Request, Steps, Tracking/Audit Log, and External Documents tabs can be viewed, printed, or emailed.
- Performing the following operations on switching sheets that are in the New or Request Rejected state only:
    - Completing the fields on the Request tab.
    - Adding, removing, modifying, cutting, copying and pasting steps within the current sheet's Steps list. Steps can be added by using the Manual Step Addition pane (See **Adding Steps Manually** on page 11-43) or by adding Comment steps. Note that cut, copy and paste operations are only supported for sheets that are in the New or Request Rejected states.
    - Adding, removing, and viewing attachments on the External Documents tab.
    - Adding comment entries to the audit log on the Tracking/Audit Log tab.
    - Incrementing and checking in versions of a switching sheet. This is done by selecting the Check-in button on the switching sheet toolbar.

Once a sheet has transitioned to (or beyond) the Prepared state, Switching Request users are limited to view-only mode.

Completing the Request Tab

Follow the steps in the previous sections to start a new planned switching sheet. Then use the **Request** tab to enter basic information about the switching sheet before you begin adding steps. When a new sheet is created, the user ID of the person who created it is automatically displayed in the **Requested By** field. You should complete as much of the information on this tab as possible.

When you have completed the information on the Request tab (fields described below)**,** update the sheet state to **Requested** on the Tracking/Audit Log tab. See **Changing the Switching Sheet State** on page 11-23 more information.

> **Note**: The switching sheet is automatically saved after a state change, and an entry is added to the audit log.

The Request tab contains the following fields:

- **Owner** displays the current owner of the switching sheet. See **Taking Ownership** on page 11-23 for more information.
- **Replication** allows you to indicate a replication pattern to use when scheduling the work to be done. This will split the sheet into multiple sheets with Start and Finish dates based on the Replication option you select. See **Replication** on page 11-23 for more information.
- **Requested By** displays the person who requested the switching order. This field is initially populated with the ID of the user who created the switching sheet and can be updated. A value is required prior to submitting the request.
- **Phone Number** displays the phone number of the person requesting the switching order.
- **Email Address** displays the email address of the requester.
- **Customer Name** displays the name of the customer requesting the interruption.
- **Phone Number** displays the phone number of the customer requesting the interruption.
- **Email Address** displays the email address of the customer requesting the interruption.
- **Charge Number** allows you to enter charge numbers that can then be executed and/or used by the switching sheet preparer.
- **Office** displays the office responsible for the switching sheet.
- **Location** displays the street address or specific location for the switching operation.
- **Nominal Substations** displays the substations where the switching operation takes place. The **Update** button ( ) is used to update the **Nominal Substations** field based on a distinct list of substations as identified by the device populated in the **Device** field and devices listed in steps. The substations listed will be the nominal substations for the devices.
- **Current Substation** displays the current substations for the switching sheet and step device associated to the switching sheet. When the switching sheet is loaded, this field will dynamically update as status changes occur in the system.

  Note. See **Device Associations with Nominal and Current Network Components** on page 11-2 for information.
- **Device** displays the device being worked on (not necessarily the device being switched). This device is given to the master event associated to the switching sheet after the switching sheet has been scheduled. The following buttons are displayed to the right of the **Device** field:
  - The **Device Lookup** button ( ) is used to search for and select a device.
  - The **Link Device** button ( ) to link a device selected from the Viewer to this switching sheet. First, select the device in the Viewer, then click this button. The **Device** field is populated with the selected device name. If the Link **Device** button is selected when the Location, Substations, Feeders, and/or Voltage fields are already populated, then a confirmation dialog box will be displayed asking if the user wishes to replace those values. This is

similar to selecting the Update **Device-Related Fields** option from the **Actions** menu.

- The **Unlink Device** button ( ) is used to clear the device field.
- The **Focus** button ( ) is used to locate this device in the Viewer.

- **Description of Work** displays a general description about what the switching sheet should try to accomplish.
- **Start Date** displays the date and time the switching work is scheduled to begin. This is required when scheduling a switching sheet. This is the Start Date given to the master event associated to the switching sheet after it has been scheduled. This is also used to generate the Impacted Customers list if no Planned Date is specified for a step. Enter the time in military time format (for example, 13:00 = 1 P.M.).
- **Alt. Start Date** displays the alternate date and time the switching work could begin. Enter the time in military time format (for example, 13:00 = 1 P.M.). The alternate start date must be later than the start date.
- **Finish Date** displays the date and time the switching work is scheduled to end. This field is required when scheduling a switching sheet. This date is the Estimated Restore Time (ERT) given to the master event associated to the switching sheet after it has been scheduled. The finish date must be later than the start date, and you must enter the finish time for the date to be valid. Enter the time in military time format (for example, 13:00 = 1 P.M.).
  - Use the **Update ERT** button to update the ERT for the master event associated to the switching sheet. This option is only available after the sheet has been scheduled. This button is displayed next to both the Finish Date and Alt. Finish Date fields. The button is grayed if no date has been entered yet for the field.
- **Alt. Finish Date** displays the alternate date and time the switching work could end. The alternate finish date must be later than the alternate start date. Enter the time in military time format (for example, 13:00 = 1 P.M.).
- **Nominal Feeders** displays nominal feeders that are relevant to the switching sheet. This is a text entry field and is not auto-populated. The **Update** button ( ) is used to update the **Nominal Feeders** field based on a distinct list of feeders as identified by the devices populated in the Device field and devices listed in steps.
- **Current Feeders** displays the current feeders for the switching sheet and step devices associated to the switching sheet. When the switching sheet is loaded, this field will dynamically update as status changes occur in the system.
- **Voltage** displays a drop-down list that lists the nominal device voltages. This list is dynamically generated based on a distinct list of voltages as determined by querying the `NETWORK_COMPONENTS` table.
- The **Update** button ( ) is used to update the Voltage field based on the voltage of the device populated in the **Device** field.
- The **Crew Will Switch** check box allows you to indicate whether the requesting crew will perform the switching activities.

- The **Crew Will Restore** check box allows you to indicate whether the requesting crew will restore the outage associated with the switching activities.
- The **Grounds Required** check box allows you to indicate whether the crew is required to place grounds on the appropriate devices or not.

Taking Ownership

You can take ownership of a switching sheet to indicate that you are currently working the sheet. Once you take ownership, no other user is allowed to execute steps for the sheet or edit restricted fields. Other users can still view, lock, and edit certain fields on the sheet.

To take ownership of a plan, click the **Take Ownership** button next to the Owner field on the Request tab. Your user ID is displayed in the Owner field. You can also use this button to take over ownership of a switching sheet that is currently owned by another user. This is useful if there is a shift change and the original user does not relinquish ownership before logging off.

To relinquish ownership, click the **Relinquish Ownership** button.

An entry is recorded in the audit log whenever ownership of a sheet changes.

Changing the Switching Sheet State

A switching sheet passes through different phases during the creation and completion of the plan. These phases are represented by "states" that follow a logical sequence and determine what you can do with a switching sheet.

> **Note:** The state of the switching sheet should not be confused with the status of individual switching steps within the switching sheet.

A switching sheet's current state is displayed on the Tracking/Audit Log tab. This tab also displays a button ( ) for each valid state to which the sheet can transition and allows you to enter a comment associated with the state transition.

To change the state of a switching sheet, click the appropriate state change button on the Tracking/Audit Log tab. It is helpful to provide comments or a reason for the state change.

The Audit Log table on the Tracking/Audit Log tab shows a history of all state transitions for the sheet, including the ID of the user who updated the state and the time stamp of the change. See **Viewing the Audit Log** on page 11-77 for details.

Replication

A switching sheet may require work to be done that crosses into many weeks or days. In some cases this work may require the crews to repeat certain actions each day. To help create these sheets, a replication value can be specified prior to scheduling the switching sheet. The three options are as follows.

- **Daily** will replicate the switching sheet for each day between the **Start** and **Finish** dates.
- **Daily, No Weekends** will replicate the switching sheet for each day between **Start** and **Finish** dates, excluding weekends.

- **Continuous, No Weekends** will replicate the switching sheet only if the **Start** and **Finish** dates cross over a weekend. The replicated sheets will include days of the week and not weekends. If a sheet's **Start Date** begins on a Thursday and goes through to the following Wednesday, one additional sheet will be replicated for a total of two sheets. The first sheet will be for Thursday and Friday; the second sheet will be Monday-Wednesday.

When you attempt to schedule the switching sheet, a confirmation dialog will come up asking you whether the sheet should be replicated or not. At this point, you could decide not to replicate the switching sheet, which will keep the original master sheet as it is and it will be the only sheet for this job.

Once scheduled, the system will determine how many sheets should be created based on the entered **Start** and **Finish** dates on the **Request** tab for the switching sheet. The appropriate dates will be filled out for each of the new switching sheets and the original master sheet's dates will also be modified to account for the division of work between the sheets. The audit log will be updated with entries indicating what sheets were created as part of the replication process.

If a **Replication** option was selected when the sheet was scheduled, then the user will be asked to cancel any replicated switching sheets when the master switching sheet is canceled. This allows you to easily cancel the entire group of switching sheets rather than having to cancel each replicated sheet individually.

> **Note:** In the NMS product configuration, the replication limit is set to 30; this limit can be increased or decreased based on a project's requirements.

Rework

The rework state is used to make updates to a previously completed switching sheet. The rework state allows numerous changes to be made to the switching sheet including, but not limited to:

- Adding, removing, and updating switching sheet steps. Any modifications made to the steps while in the Rework state will force the sheet to increment its version number by one.
- Updating the Request with further details.
- Updating the Impacted Customers list.
- Altering External Documents
- Manipulating associated safety documents.

While in the Rework state, special processing functions allow real-time completed steps to be deleted. The steps will remain linked to the switching sheet, but will be marked as deleted. If you change your view of the steps to view differences between another state where the step was present, then that step will show up in the Completed state, but will be marked with a red background and strike-through text. You will not be allowed to delete real-time completed steps that are linked to events or safety documents (an error dialog box will open if you attempt to do this).

The Rework state also allows the switching sheet's linked events to be corrected using Outage Correction. All of the rules that apply to standard Outage Correction switching sheets also apply to a switching sheet when it is in the Rework state. Any date related

updates should be applied to the step's **Completed Date** column. See **Outage Correction** on page 11-124 for more details.

Switching sheets in the Rework state will not be flagged for model verification if any step device has been altered by a model change. This is true for the Completed state as well.

When transitioning out of the Rework state and back into the Completed state, any step that is in the New or Uninstructed step will be automatically completed if you approve the change from the confirmation dialog box. If you do not approve the change, then the state transition will be canceled and it will be left to you to transition the incomplete steps to a terminal state.

Switching Sheet States

The following table describes the switching sheet states.

State	Description
New	Indicates that the switching sheet is in the process of being created but has not yet been requested. When you create a switching sheet, its initial state is New.
Requested	Indicates that the sheet has been requested. A sheet transitions to this state when a user clicks the **Submit Request** button on the Tracking/Audit Log tab. This state is valid for planned switching sheets only. From this state, a sheet can progress to either the Rejected or Prepared state.
Rejected	Indicates that the request was rejected. A sheet transitions to this state when a user clicks the **Reject** button on the Tracking/Audit Log tab. The Reject button is grayed until you select a Reason. This state is valid for planned switching sheets only. From this state, a sheet can be requested again by clicking the **Submit Request** button on the Tracking/Audit Log tab.
Prepared	Indicates that the sheet has been prepared. A sheet transitions to this state when a user clicks the **Prepare** button on the Tracking/Audit Log tab. Although not required, all information for the switching sheet should be entered before you transition to this state. This state is valid for planned switching sheets only. From this state, a sheet can transition to the Checked state.
Checked	Indicates that the sheet has been checked. A sheet transitions to this state when a user clicks the **Check** button on the Tracking/Audit Log tab. All information for the switching sheet should be entered before you check the sheet. This state is valid for planned switching sheets only. From this state, a sheet can be approved, rejected, or scheduled.
Approved	Indicates that the sheet has been approved. A sheet transitions to this state when a user clicks the **Approve** button on the Tracking/Audit Log tab. All information for the switching sheet should be entered before you approve the sheet. This state is valid for planned switching sheets only. From this state, a sheet can be scheduled.

State	Description
Check Rejected	Indicates that the sheet was rejected after being checked. A sheet transitions to this state when a user clicks the **Reject** button on the Tracking/Audit Log tab. The Reject button is grayed until you select a Reason. This state is valid for planned switching sheets only. From this state, the sheet can be prepared again.
Scheduled	Indicates that the sheet has been scheduled. A sheet transitions to this state when a user clicks the **Schedule** button on the Tracking/ Audit Log tab. All information for the switching sheet should be entered prior to scheduling the sheet. This state is valid for planned switching sheets only. From this state, a sheet can be canceled or issued.
Canceled	Indicates that the sheet was canceled. A sheet transitions to this state when a user clicks the **Cancel** button on the Tracking/Audit Log tab. The Cancel button is grayed until you select a Reason. This state is valid for planned switching sheets only. From this state, a sheet can be scheduled again.
Issued	Indicates that the sheet has been issued. A sheet transitions to this state when a user clicks the **Issue** button on the Tracking/Audit Log tab. All information for the switching sheet should be entered before issuing a sheet. This state is valid for planned switching sheets only. From this state, a sheet can transition to the Hold/ Pending, In Progress (automatically), or Completed state.
In Progress	Indicates that at least one switching step in a planned or emergency switching sheet has been instructed or completed in real-time mode. From this state, a sheet can transition to the Hold/Pending or Complete state.
Hold/Pending	Indicates that the sheet is on hold. A sheet transitions to this state when a user clicks the **Hold/Pending** button on the Tracking/ Audit Log tab. From this state, a sheet can progress to the In Progress (automatically) or Complete state.
Completed	Indicates that the sheet has been completed in real-time mode. A sheet transitions to this state when a user clicks the **Complete** button on the Tracking/Audit Log tab. A terminal action (Complete, Delete, Abort or Fail) must have been taken for each of the switching steps before a sheet can be completed. (See **Switching Sheet Step States** on page 11-41 for information about step states.) While the sheet is in the Completed state, it cannot be edited. This state applies to both planned and emergency switching sheets.
Rework	Indicates that the sheet has been previously completed and later placed into a rework state allowing further updates to be applied to the switching sheet. The Rework state is also used to enable Outage Correction for the events linked to the switching sheet. From this state, the sheet can again be transitioned to the Completed state. See **Rework** on page 11-24 for further details.
Deleted	Indicates that the sheet was deleted using the **Delete** button on the Tracking/Audit Log tab. The Delete button is grayed until you select a Reason.

State	Description
Executed	Indicates that the switching steps in a FLISR or Optimization switching sheet have been completed successfully. This state is set automatically by the system after completion of all steps in the switching sheet and is valid for FLISR or Optimization switching sheets only. From this state, a sheet can transition to the Completed, In Progress, or Hold/Pending once you have reestablished the single user lock over the sheet.
Error	Indicates that at least one step has failed in the execution of switching steps in the FLISR or Optimization switching sheet. This state is set automatically by the system when it finds an error in the execution of steps and is valid for FLISR or Optimization switching sheets only. From this state, a sheet can transition to the Completed, Hold/ Pending, or In Progress once you have reestablished the single user lock over the sheet.

Adding and Editing Steps

This section describes how to add and edit steps in a switching sheet. It includes the following topics:

- Steps Tab
- Switching Sheet Step States
- Adding Recorded Steps to a Switching Sheet
- Adding Comment Steps
- Copying and Pasting Steps
- Creating Go-Back Steps
- Working with Blocks
- Grouping and Ungrouping Steps
- Editing Existing Steps
- Finding and Replacing a Device in the Steps
- Finding and Replacing Text in the Steps
- Focusing on a Device in a Step
- Moving a Crew

Steps Tab

Use the Steps tab to add, edit, record, instruct, and execute steps in a switching sheet.

Steps tab topics include:

- Steps Tab Fields
- Steps Tab Toolbar and Context Menus
- Steps Tab Events and Crews Pane

Steps Tab Fields

The steps table on the **Steps** tab displays the following fields:

- **Step #** displays the number of the step.
  - For a block header row, this column displays the block name.
  - For a step row, this column displays the step number (1 through n).
  - For a sub-step within an aggregate step, such as Open & Tag, this column displays the sub-step number (a-z). Blocks and aggregate steps can be expanded or collapsed by clicking the + or - sign.
  - If you are viewing the differences between this version and another version, this column uses outline numbering (1.1, 1.2, and so on) to identify steps that were added since the previous version. See **Working with Switching Sheet Versions** on page 11-65 for more information.
- **Version** displays the version number of the switching sheet when the step was added. See **Working with Switching Sheet Versions** on page 11-65 for more information.

- **Operation displays t**he description of the switching action. When the switching action is associated to a safety document, then the safety document type and number will be displayed in this field after the switching description. This field is editable, but only if the step action is a non-operational action. In other words, if the action for this step does not impact the NMS model in any way and is not tied to another NMS tool or feature, then the text can be edited in this column. Edited text will show up with a yellow background color. To reset the value, see **Resetting Operation Text** on page 11-44.
- **Device** displays the device alias referenced in the step. If the device is not modeled, then the **Device** field will have a yellow background meaning that the device does not have a handle or a valid NCG and cannot be focused upon in the Viewer.
- **Phases** displays the phase that was selected for the step. When obtaining a device through a Viewer device selection, all the phases are selected by default.
- **Details** displays information about the outcome of the switching step, such as:
  - Deenergize a section of the network.
  - Energize a section of the network.
  - Make a loop.
  - Break a loop.
  - Make a parallel. (The feeders involved in the parallel will be listed.)
  - Break a parallel. (The feeders involved in the parallel will be listed.)

This information is recorded into the step when the step is initially added to the switching sheet, but is not dynamically updated as changes are made to the sheet. You can enter text into this field to replace the text that is automatically inserted.

- **PFSummary** displays the summary of power flow results with violations count before and after the analysis (VB: #Violations Before; VA: #Violations After). It is visible only when the sheet has power flow results. To show Power Flow details in individual columns, click the Hide/Display Power Flow columns button ( ); the PFSummary column will be replaced by the following columns:
  - **Feeders Affected:** List of feeders affected by the step.
  - **Violations Before:** Number of violations before the step is executed.
  - **Violations After:** the number of violations if the step is executed.
  - **Customers Impacted:** Summary of number of regular and critical customers impacted if the step is executed.
  - **Affected DERs:** Summary of number of primary and secondary distributed energy resources impacted if the step is executed.
- **Status** displays the state of the switching sheet step. See **Switching Sheet Step States** on page 11-41 for information.
- **Crew Ready** displays whether the field crew is ready to be instructed or not.
- **Ready Date** displays the date and time when **Crew Ready** is populated. Double click to override this value.
- **Planned Date** displays the proposed date/time when this step will be performed. The Planned Date is used to generate more accurate and detailed

Impacted Customer lists **and** to specify the ERT for the generated Planned Events. This date must be within the Start and Finish Dates specified on the Request tab. This date is automatically updated when the switching sheet's Start and Finish Dates are updated. Thus, if the work is rescheduled, the planned date values do not have to be manually updated as well.

- **Executed By** displays the user ID of the person who completed the step in real-time mode. This field is automatically populated by the system.
- **Completed Date** displays the date the step was completed. If this field is blank when a step is completed, failed, or aborted in real-time mode, then the system populates this field automatically. If you enter a date in this field before executing a step, that date is used instead. This allows you to specify when an action actually occurred. (This field is similar to the date field on the Control Tool.) If you attempt to edit this date after the step has been completed in real-time, the system checks to see if the step affects any events. If it does, the system prompts you to confirm that you want to change the affected start date or restoration date, as applicable, based on the event association.
- **Instructed By** displays the user ID of the person who instructed the step in real-time mode. This field is automatically populated by the system.
- **Instructed To** displays the IDs of the crews to which the step was instructed. This field is automatically populated if crews are selected in the Crew List on the Steps tab header when you instruct a step. This field cannot be edited manually.
- **Instructed Date** displays the date and time the step was instructed. If this field is blank when the step is instructed, then the system populates this field automatically. If you enter a date in this field before instructing a step, that date is used instead.
- **Address** displays the address of the device referenced in this step. This field is automatically populated if you record the step by initiating an action within the Viewer. This field is editable and can be used to update address values of future recorded steps. For more information, see **Save all device addresses to the database** on page 11-31.
- **Comments** displays any additional information associated with this step. You can enter free-form text in this field.
- **Hidden Columns:** The following columns are hidden by default from view.
  - **Cond Cls** displays the step's associated condition handle class.
  - **Cond Idx** displays the step's associated condition handle index.

  The Cond Cls and Cond Idx columns display the class and unique condition identifier, respectively, associated to the step. A condition handle is associated to a step when the step manipulates a condition, such as an Apply Condition step or a Grounding step.

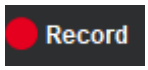
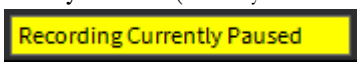
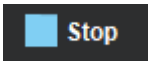
  To display the Cond Cls and Cond Idx step columns, right-click the Steps table header row and select **Select Columns...** to open the Select Columns to Display dialog box. Select **Cond Cls** and **Cond Idx** and click **OK**.

Steps Tab Toolbar and Context Menus

The Steps tab toolbar displays buttons for actions that you can perform. If a button is grayed, then that action is not currently permitted. For example, if you are currently in Study Mode, then the Start Study Session button is grayed. Some toolbar buttons, such as

the Cut and Paste options, are also available through a context menu that is displayed when you right-click a step row. The context menu contains some options that do not appear on the toolbar.

The following table describes all actions that can be performed on the Steps tab with toolbar buttons, keyboard shortcuts, and/or context menu items.

To perform this action:	Do this:	Comments
Turn record mode on	Click 	Record mode must be on in order to record operations in the Viewer using the Control tool. Before you click **Record**, the status bar displays **Recording Currently Off**. **Note:** If you shift focus to another event while recording is on and then record steps for that other event (either in the Miscellaneous Log or in the Event Details **Steps** tab), the recording mode status on the switching sheet will change to **Recording Currently Paused** (with a yellow background). 
Turn record mode off	Click 	Before you click **Stop**, the status bar displays **Recording Currently On**.
Save all device addresses to the database	Click	If you change one or more device addresses in a switching sheet, this action updates the devices' addresses throughout the switching sheet and also updates the device attribute table so that any new switching sheets referencing these devices will use the new addresses.
Focus the Viewer on the objects referenced in the currently selected list of steps	Click	The toolbar button, when used with single step selections, will focus on a single device and set the environment's selected device to the step's associated device. When multiple steps are selected, the Focus button will force the viewer to display all of the step devices in one view. **Note:** If you have devices across many feeders, then many maps may need to be loaded to accommodate your request. This multi-device option is similar to the Dynamic View area each switching sheet automatically has associated to it on the View Areas tab.
Mark the selected step as crew ready for instruct.	Click	This action is only permitted in real-time mode when the plan reaches the Issued state. This button is enabled only when the step state is New or uninstructed. When you click this button, the Crew Ready and Ready Date columns will be populated.
Instruct the selected steps	Click	This action is only permitted in real-time mode when the plan reaches Issued state. Note that step order execution rules apply when enabling this button (see **Step Order Execution Rules** on page 11-50 for details). When you select this button, the Instructed By and Instructed Date columns are populated.

To perform this action:	Do this:	Comments
Complete the selected steps	Click	Once the action is complete, the status of the step changes to *Completed* (see **Switching Sheet Step States** on page 11-41). If you are in real-time mode, the Completed Date column is also updated with the current date. Note that step order execution rules apply when enabling this button (see **Step Order Execution Rules** on page 11-50 for details). The Complete button is enabled in real-time mode when the plan reaches the Issued state. **Note:** To complete a step in real-time mode, you must have authority over the device.
Abort the selected steps	Click	Use this action if a step was never attempted. When you click this button, the status of the step changes to *Aborted* (see **Switching Sheet Step States** on page 11-41). If you are in real-time mode, the Completed Date column is updated with the current date. However, the switching action is not actually performed.
Mark the selected steps as failed	Click	Use this if a step was attempted but failed. When you click this button, the status of the step changes to *Action Failed* (see **Switching Sheet Step States** on page 11-41) and the Completed Date column is updated with the current date. However, the action is not actually performed against the real-time data model.
Clear the Crew Ready status		Use this action to clear the Crew Ready and Ready Date columns. This button is enabled only when the step state is in new or uninstructed state.
Uninstruct an instructed step	Click	Use this action to change the state of an instructed step to *Uninstructed* (see **Switching Sheet Step States** on page 11-41). If the step has a device and an instruct condition on the device, then the condition will be removed prior to the step transitioning to the *Uninstructed* state. Steps that are in the *Uninstructed* state can be instructed again or aborted, failed or completed. **Notes:** • The uninstruct action is not available for SCADA instructed actions. This option is not available for steps in the *SCADA Pending* state. • Uninstructed steps may be deleted. • If you are using version controls, uninstructed and deleted steps may be red-lined and not deleted from the database. See **Working with Switching Sheet Versions** on page 11-65 for more information.

To perform this action:	Do this:	Comments
Verify steps after model changes	Click	This action is available if model changes have occurred that impact one or more devices in the switching sheet. The Web Switching service checks all the opened switching sheet steps after a model edit has occurred. If a step has a device that matches a device that was directly impacted by a model change, that step will be marked as needing verification. When the sheet is displayed, these steps will be highlighted in yellow. You can either check off each step in the sheet as they are verified or check off the entire sheet. **Notes:** • Outage Correction sheets are not included in this processing. Outage Correction validates the devices when the correction is made. • While the sheet has verifications pending, step executions cannot be performed within the sheet. • Switching sheets in the Completed or Rework states are not included in this processing. • Any device related field values that are pulled from model or attribute data will be dynamically updated after the model change. This includes the device fields on the **Request** tab and the device fields for a switching sheet step. **Individual Verification** • To check off each step individually, right-click the highlighted step and select **Model Verify**. **Whole Sheet Verification** • To check off all of the steps in a sheet, click to Confirm all model changes. All highlighted steps will be marked as verified. Once the steps have been verified, step execution can continue for the sheet.
Reset study session and clear the status of the steps	Click	This action is only available in Study Mode. When you click this button, you are prompted to select either Real-Time, Nominal, or the Save Case Management tool. • Choose **Real Time** to replicate the real-time device states. • Choose **Nominal** to reset all devices to their predefined normal state. **Note:** The **Real Time** and **Nominal** options will immediately clear the status of the steps in the current sheet. They will also clear the study step statuses in any other open sheets. • Choose **Save Case Management...** to display the Save Case Management tool, which allows you to reset to a save case. See **Using the Save Case Management Tool** on page 2-94 for more information.

To perform this action:	Do this:	Comments
Switch to current Real-Time Mode	Click	This action is only available when you are in Study Mode. When you click this button, the status bar displays real-time mode in red and Viewer changes to real-time mode.
Switch to Study Mode	Click	This action is only available when you are in real-time mode. When you click this button, the status bar displays study mode in gray and Viewer changes to study mode.
Find and replace text	Click	Use this to find and replace all occurrences of a device (see **Finding and Replacing a Device in the Steps** on page 11-53) or text (see **Finding and Replacing Text in the Steps** on page 11-54) in the switching steps.
Cut steps to the clipboard	Click	Select one or more steps. The selected steps are marked as being cut and are placed on the clipboard. The steps will only be moved after they have been pasted to their new location. Use the Paste option to paste the steps. This option is disabled if the sheet is in view only mode or the sheet state is Completed. Alternatively, right-click and choose **Cut** from the context menu or press **Control+X**.
Move Steps to the Miscellaneous Log	--	This action moves Real Time Completed, Aborted, Failed or Instructed steps to the Miscellaneous Log. SCADA Pending steps cannot be moved until they have transitioned to one of the states already stated. Steps associated to safety documents are also not allowed to be moved. Any step in a New or Uninstructed state will not be moved as the Miscellaneous Log only displays Real Time steps that are in a terminal or Instructed state. Any attempt to move an immovable step will result in an error dialog box and the steps will not be moved from the switching sheet's steps list. To move steps to the Miscellaneous Log, select one or more steps and select **Move Steps to Misc Log** from the Actions menu or from the right-click context menu.
Copy steps to the clipboard	Click	You can select one or more steps. The selected steps are copied to the clipboard. Use the Paste option to paste the steps. Alternatively, right-click and choose **Copy** from the context menu or press **Control+C**.
Copy steps as go-back steps	Click	You can select one or more steps. Reverse steps are created for each selected step and copied to the clipboard. Use the Paste option to paste the steps. Alternatively, right-click and choose **Copy as Go-Backs** from the context menu or press **Control+G.**

To perform this action:	Do this:	Comments
Paste steps from clipboard	Click	Steps are pasted after the currently selected step. The operation pastes the steps that were placed in the clipboard during the last Cut, Copy, or Copy as Go-Backs operation. Once the steps have been pasted, the Paste button is no longer available and the contents of the clipboard are cleared. This option is disabled if the sheet is in view only mode or the sheet state is Completed. Alternatively, right-click and choose **Paste** from the context menu or press **Control+V**.
Delete steps	Click	Deletes the selected steps from the plan. This button is disabled if the sheet is in view only mode or if the step has transitioned beyond its initial state (No State). Alternatively, right-click and choose **Delete** from the context menu or press **Control+D**.
Undo the last action	Click	Allows you to undo the last action (Cut/Paste, Copy/Paste, Delete, Add Step). The Undo function returns an error (*Undo is not supported across multiple sheets.)* when: • attempting to undo pasting steps cut from another switching sheet • the last action was not on the currently active sheet; for example, if you insert a step on Sheet A and then switch to Sheet B and click Undo. Alternatively, right-click and choose Undo from the context menu or press **Control+Z**.
Return to Nominal	Click	The Return to Nominal function generates a block of switching sheet steps that contain all the steps needed to switch the affected devices back to nominal. They will be presented in a logic order, will not outage any customers, and are logically grouped. **Note:** The generated block of steps are not go-back steps.
Add a Safety Document for a step	Click	The **Create Safety Document for Selected Step** button creates a safety document for a selected step. If the system cannot determine the type of safety document to create for the step, the Select Safety Type dialog box will open so you may choose the type. If the step selected is not valid for safety documents, an error dialog box will be displayed. An error dialog box will also be displayed if any of the selected steps are already linked to a safety document. Once a safety document type has been determined or selected, the safety document dialog box opens. This option is disabled if the sheet is in view only mode or the sheet state is Completed. See **Working with Safety Documents** on page 11-102 for more detail.
Create a Safety Document	Click	The Create Safety Document button opens a context menu that allows you to choose a safety document type or open the Select Safety Type dialog box. See **Working with Safety Documents** on page 11-102 for more detail.

To perform this action:	Do this:	Comments
Remove Links to Safety Documents	Click	Unlinks (removes the association to) a step's device from a safety document's device list. First, select the step with the device operation you want removed from the safety document, then click the button. See **Linking and Unlinking a Step to Safety Document** on page 11-50 for details. Alternatively, right-click and select **Remove Links to Safety Documents** from the context menu.
Complete all steps up to the selected step in 'silent' mode	Click	Use this action to complete all steps up to and including the selected step in 'silent' mode, which means that the system will auto-complete the operations without displaying the Look Ahead window. This option is only available in Study mode if you select a single row that has not already been completed. This is useful if you need to get a study session back to a point where you previously left off. Alternatively, right-click and choose **Complete to Here** from the context menu.
Launch Feeder Load Management for the selected steps' feeders.	Click	Feeder Load Management may be launched when at least one step is selected. The **Feeder Load Management...** option is also available on the right-click option menu in the Steps table. This option is only available when Power Flow and FLM are both licensed and configured.
Run Power Flow analysis.	Click	Displays the Power Flow Analysis wizard. See **Power Flow Analysis in Switching Management** on page 11-87 for more information.
Hide/Display Power Flow columns	Click	This button is enabled if the plan has power flow results. By default, if a plan has PF results, the PF Summary column is displayed and other power flow related columns are hidden. This action toggles the display of PF Summary and other columns.
Execute the entire plan	Click	Executes the entire plan for FLISR or Optimization switching sheets only.
Clear all FLISR actions	Click	Clears all FLISR action conditions. Applies only to FLISR switching sheets.
Show or hide events and crews	Click to show or to hide the header	Shows or hides the Events and Crews pane, which displays crew and event associations. See **Steps Tab Events and Crews Pane** on page 11-38.
Show Manual Step Addition Form	Click	Shows the Manual Step Addition pane, which allows you to add steps without using the Control Tool. See **Adding Steps Manually** on page 11-43.
Add a new block header	Right-click and choose **Add New Block Header** from the context menu, then select the block type	Inserts a new block header of the selected type: Isolate, Fault Location, Maintenance, Restore, Construction, or Custom. If you choose Custom, you are prompted to enter the block header name. See Adding a New Block Header for more information. This option is disabled if the sheet is in view only mode or the sheet state is Completed.

To perform this action:	Do this:	Comments
Rename an existing block header	Right-click and choose Rename Block Header from the context menu, then select the block type	Rename an existing block header to one of the following types: Isolate, Fault Location, Maintenance, Restore, Construction, or Custom. If you choose Custom, you are prompted to enter the new block header name. See **Renaming a Block Header** on page 11-47 for more information. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Change an instructed date	Right-click and choose Update Instructed Dates... from the context menu.	This option is used to update multiple Instructed Date step fields in one operation. When selected, this option will display the Update Instructed Date dialog box. From this dialog box you can enter in a new Instructed Date for the steps that are currently highlighted in the steps list. Any steps that have not been instructed will not be updated.
Clear the Planned Date field for this step	Right-click and choose **Clear Planned Date** from the context menu.	This action is only available if the step has a value in the Planned Date column. Click this button to remove the date and leave the Planned Date column blank. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Clear the **Instructed To** field for this step	Right-click and choose **Clear Crews** from the context menu.	This action is only available if the step has a value in the Instructed To column. Click this button to remove the crew and leaves the Instructed To column blank. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Clear the step's **Condition Class** and Index fields for this step.	Right-click and choose **Clear Condition Indexes** from the context menu.	The action will only happen for steps that are not in a terminal state and steps that are not associated to safety documents. Click this button to remove the condition class and index associated to the step. An error dialog box will be displayed if any of the selected steps' condition handles could not be cleared.
Group steps	Right-click and choose **Group Steps** from the context menu.	Groups the selected steps and draws a bracket around them in the Steps list. This allows steps to be completed in or out of order within the grouping depending on the switching sheet type. See **Grouping Steps** on page 11-49. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Ungroup steps	Right-click and choose **Ungroup Steps** from the context menu.	Ungroups the selected steps and revises or removes the group bracket. (If you ungroup the third of three steps, the first 2 remain grouped.) See **Ungrouping Steps** on page 11-49. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Insert a blank step	Right-click and choose **Insert Blank Step** from the context menu.	Inserts a new blank step after the currently selected step. This is useful for adding comment steps. See **Adding Comment Steps** on page 11-44 for more information. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
Mark the location where steps should be inserted	Right-click and choose **Place Step Insertion Indicator** from the context menu.	Designates where newly recorded steps should be added. When you choose this option, a visible marker appears. The next recorded step is inserted after the marker. Each time you add a recorded step, the marker moves down to the newly recorded step, so that steps are added in the order in which they were recorded. This option is disabled if the sheet is in view only mode or the sheet state is Completed.

To perform this action:	Do this:	Comments
Remove step insertion indicator	Right-click and choose **Remove Step Insertion Indicator** from the context menu.	When you click this option, the indicator is removed and any newly recorded steps will be added to the end of the steps list. This action is only available when the step insertion indicator is showing.
Link to Safety Document	Right-click and choose **Link to Safety Document** from the context menu.	When you click this option, all safety documents associated with the switching sheet will be displayed. On selecting any of the safety documents in the submenu, the selected safety document will be associated to the currently selected step. See **Linking and Unlinking a Step to Safety Document** on page 11-50 for details.
Load the associated safety documents	Right-click and choose **Load Safety Documents…** from the context menu.	If any of the selected steps are associated to a safety document, then that document will be loaded for each step. The document type and number appear in the Operation column of the step when there is an association.
Move the crew symbol to a new device in the Viewer	Right-click and choose **Move Crew** from the context menu.	When this option is selected for a step with a crew instruction, the crew symbol within the Viewer is moved to the device specified in that step. This feature is only used to move the crew symbol within the viewer.
Move a column in the Steps list	Click the column heading and drag it to the desired position.	This allows you to rearrange the order in which columns are displayed. For example, if you want each step's status to display in the first column, click the Status column header and drag it to the left of the Step # column.

Steps Tab Events and Crews Pane

The **Events and Crews** pane provides information on the events and crews associated with the sheet. Use the **Show Event and Crews** (▼) and **Hide Events and Crews** (▲) buttons on the Steps tab toolbar to expand and minimize the pane.

Events List

The **Events List** lists all events associated with the switching sheet. If you created a switching sheet from the Work Agenda Event List, the associated event is automatically displayed in the Events list. Use this list to view, add, and remove event associations and to view more information about the events. (For more information about associating events to switching sheets, see **Event Associations** on page 11-98.)

The Events List displays the following fields and buttons:

- The **Event** column displays the number of the associated event.
- The **Association** column displays the type of association. The list can have the following types of associations and will be listed in the order of Master, Planned, Forced, Manual and Canceled. Manual event associations are event associations that are added using the Add Event Association button on this window.
- The **# Out** column displays the number of customers outaged by this event.
- The **Status** column displays the status of the event, such as NEW, P-NEW (New Planned Event), or W-ASN (Master Switching Event).
- The **Device** column displays the name of the device.

- The **Add Event Association** button () opens a dialog box that allows you to enter an event number to associate with the switching plan. The event number can also be populated by selecting an event in the Work Agenda Event List. These events will show up as "Manual" associated events within the Events list. See **Event Associations** on page 11-98 for more information.
- The **Remove Event Association** button ( ) removes the selected event association from the switching plan. When an event is linked to a switching sheet step, an error dialog box will open indicating this and the removal will be canceled. To remove events that have linked steps, the steps have to be moved in order for the event to be removed. This option is disabled if the sheet is in view only mode or the sheet state is Completed.
- The **Event Details...** button ( ) displays the Event Details window for the selected event.
- The **Call...** button ( ) displays the Event Details Trouble Info tab for the selected event.
- The **Highlight in Work Agenda** button ( ) selects the event within the Work Agenda Event List.
- The **Show in Viewer 1** button ( ) focuses Viewer 1 on the associated device.

Crews List

The Crews List displays crews that are associated to the switching sheet; they may be directly associated using Crews List **Select Crew...** function or by virtue of being assigned or en route to an associated event. If you created a switching sheet from the Work Agenda Event List, any crew associations are automatically displayed in the Crews list on the Steps tab header.

The Crews List displays the following information:

- The **Crew ID** column contains the crew ID of the crew.
- The **Event** column contains the event number the crew is assigned or en route to.
- The **Contact** column contains the contact name for the crew.
- The **Mobile #** column contains the contact's mobile phone number.
- The **Mobile Carrier** field displays the wireless company providing service to the mobile phone or radio.
- The **Alternate Number** field displays an alternate number for the crew.
- The **Alternate Number Type** field displays the crew's alternate number type (for example, home, personal mobile, and so on).
- The **Pager #** column contains the contact's pager number.
- The **Status Date** column contains the date and time when the crew was assigned, placed en route, or placed onsite to the event. This column is cleared when a crew is released from all of its events.The **Status** column indicates whether the crew is assigned or en route to the event shown in the **Event #** column.
- The **Type** column contains the crews' type (for example, Trouble).

- The **Crew Info** button ( ) displays the Crew Info window for the selected crew. This button is enabled only if a crew is selected from the list. For more information, see **Associating Crews** on page 11-59.
- The **Update 'Instructed To' in Steps** button ( ) updates the Instructed To column for the selected steps with this crew's ID. This option is disabled if the sheet is in view only mode or the sheet state is Completed. This action will only be applied to steps in the Instructed or Completed states. Any selected step in any other state will be ignored.
- The **Move Crew** button ( ) allows you to move a crew to the device associated with the selected step. This button is enabled only when the selected crew is en route or on-site to the associated event.
- The **Select Crew...** button ( ) opens the Select Crew dialog box from which you may select crews or create contractor (foreign) crews to associate to the switch plan. For more information see **Assigning Crews to a Switching Sheet** on page 11-40.
- The **Remove Crew** button ( ) removes the selected crew from the table if they were added with the **Select Crew...** ( ) action and are not assigned, en route, or onsite.

Assigning Crews to a Switching Sheet

The Select Crew dialog box allows you to assign crews to the switching sheet. You may also create contractor crews on the **Contractors** tab.

Selecting Crews from the System Crews List

To assign a standard (system) crew to the switch sheet

1. Click the **Select Crew...** button ( ) to open the Select Crew dialog box
2. On the **System Crews** tab, select one or more crew rows in the table.
3. Click **OK** to assign the crews and close the dialog box.

   Note: Click **Apply** to assign the selected crews without closing the dialog box.

Creating and Assigning Contractor Crews from the Contractor Entry Form

You may add a new contractor crew using the Contractor Entry Form. The created crews are assigned to the current sheet and added to the Contractor Crew List from which they may be assigned to other switching sheets or safety documents.

The form contains the following fields:

- **Crew ID:** the crew name or identifier.
- **Contact:** the name of the crew contact person.
- **Mobile #:** the crew's mobile number.
- **Mobile Carrier:** the wireless company providing service to the mobile phone or radio.
- **Alternate #:** an alternate number for the crew.

- **Alternate Type:** the crew's alternate number type (for example, home, personal mobile, and so on).
- **Pager #:** the crew's pager number.
- **Type:** crew option menu that allows you to choose the crew type.
- **Comments:** text field for comments.

Actions

- **Create and Assign Crew** (): assigns the new crew entry to the switching sheet and adds them to the contractor crew list; the Select Crew dialog box closes when this button is clicked.
- **Clear Crew Fields** (): clears the entry form.

Using the Contractor Crew List

The Contractor Crew List allows you to assign existing contractor crews to the switch sheet or populate the Contractor Entry Form to reuse crew data when creating additional contractor crews.

Assigning an Existing Contractor Crew

1. Select the crew rows in the Contractor Crew List.
2. Click the **Create and Assign Crew** button () to assign the crews to the sheet.

Assigning a New Contractor Crew Using Existing Crew Data

To create an additional contractor crew using data from an existing crew, do the following

1. In the Contractor Crew List, select the row with the desired crew data.
2. Click the **Transfer Crew Data** button () to copy the data to the Contractor Entry Form.
3. Edit the data for the new crew.
4. Click the **Create and Assign Crew** button () to assign the new crew to the safety document and add them to the Contractor Crew List.

Switching Sheet Step States

Switching sheet steps go through stages or states, just like switching sheets. Step states are described below:

> **Note**: The status of steps that are executed in Study mode is prefixed with a two-character text string. (The default prefix is "ST," but this is configurable during system implementation.) Thus, a step that was completed in real-time mode would display the status "Completed," while a step completed in Study mode would display "ST Completed."

- **No state** - No action is associated with the step.
- **Instructed** - The step was instructed.
- **Uninstructed** - The instructed step was uninstructed.
- **Completed** - The step was successfully completed.

- **Partially Completed** - This state applies only to parent aggregate steps and indicates that some but not all child steps were completed.
- Previously Completed - This state occurs when a step is completed, but the device was already in the desired state.
- **SCADA Pending** - This state applies only to actions that the system identifies as SCADA actions (that is, actions on telemetry-controlled devices). It indicates that a SCADA action was instructed.

  Note: If the system detects that the device was operated as instructed, the step state is then changed from SCADA Pending to Completed. If an error or timeout occurs, the step remains in SCADA Pending state.
- **Deleted** - The step was deleted from the sheet.
- **Aborted** - The step was marked as aborted by the user. (A step transitions to this state when the user selects the **Abort** option on the Steps toolbar.)
- **Failed** - The step was marked as failed by the user. (A step transitions to this state when the user selects the **Fail** option on the Steps toolbar.) The step can also fall into this state if the step fails to execute during automatic execution of steps within a Optimization or FLISR sheet.

Note that a terminal action (Complete, Delete, Abort or Fail) must have been taken for each of the switching steps before a sheet can be completed.

Adding Recorded Steps to a Switching Sheet

Follow these steps to add recorded steps to a switching sheet using the Viewer and the Control Tool.

Notes:

For information about adding steps to an emergency switching sheet, see **Emergency Switching** on page 11-90.

To record safety state transition steps (*that is,* steps that are associated to safety documents), see **Adding a Safety State Transition Step** on page 11-112.

1. Create or open a switching sheet (as described earlier) and display the **Steps** tab.
2. Select the step after which you want the recorded steps inserted. Right-click this step, then choose **Place Step Insertion Indicator** from the context menu. By default, steps are added to the end of the list.
3. If the Viewer is not displayed, open a Viewer by clicking the **Viewer 1** button on the Web Workspace toolbar or selecting **Viewer 1** from the Tools menu.
4. Verify that Web Switching Management is in Study Mode.
   - To enable Study Mode, click the **Switch to Study Mode** button on the Steps tab toolbar. The status bar should display "Study Mode."
5. Verify that Viewer is in Study Mode.
   - To enable Study Mode, select **Study** from the Viewer's **Options** menu.
6. Verify that recording is enabled.
   - To turn recording on, click the **Record** button on the toolbar. When recording is enabled, the toolbar displays **Stop**.

7. In the Viewer, search for the device on which you want to perform an operation.
8. Double-click the device. The Control Tool opens.
9. Select the action you want to perform. For example, to open a device, click **Operate** and then select **Open** from the list of operations. To place a tag on a device, click **Tag** and then select **Place Tag**.
10. If the step involves a device operation, the Look Ahead window opens. Click **Open** or **Close** in the Look Ahead window to continue.

    Note: The Look Ahead window informs you of the results of the operation, including the creation of parallels and loops, the number of critical customers affected, and related abnormal devices and conditions. You may be required to view additional tabs, such as View Conditions, before you can close the Look Ahead window.
11. Click **Exit** on the Control Tool dialog box. The device is updated in the Viewer and a step is added to the steps list. The new step is automatically selected.

Adding Steps Manually

The **Manual Step Addition** form allows you to add steps to a switching sheet without using the Control Tool. To add a step manually, complete the following steps:

1. Click the **Manual Step Addition** button ( ) to display the Manual Step Addition form.
2. Add device information to the **Device** field using one of these methods:

    - Select the device in the Viewer and click the **Set Device** ( ) button. The device field will be populated with the device alias of the selected device.

    Note: This method is not available to the Switching Request user type.

    - Enter a partial device alias and search for it by clicking the **Search** ( ) button to open the **Select Device** dialog box. Select the device and click **OK**.
    - Enter a device alias directly. When you tab out of the field, the system will validate that the device; if the device is not valid, the field will be highlighted to indicate that it should be corrected.

    Click the **Show in Viewer** button ( ) to focus the Viewer on the selected device.
3. Select Phases. If operating on a specific phase, uncheck phases that will not be affected by the step.

    Note: If a valid device is selected, only the phases which apply to that device are displayed. Otherwise, A, B, and C are all displayed.
4. Add the Operation. The operation is made up of two fields: a short operation code and an operation description. Click in either field and click the **Search** button ( ) to open the **Select Operation** dialog box, which is filtered to only display operations (and the corresponding operation code) valid for the device type. Select an operation and click **OK** to add the operation or click **Cancel** to close the dialog box without a selection.

    Note: If you know the operation code, you may enter it directly. If the operation code is invalid, the background of both fields will be red and

the second text field will be blank. If the operation code is valid, the background of both fields will be white and the second field will display the operation description corresponding to the typed in operation code.

5. Click the **Add Step** button (+) to add the manual step to the switching steps.

Adding a Place Ground Step Manually

If you add a **Place Ground** step, you will be prompted to Select Ground Node, which will list the conductors attached to the selected device and their energy status (energized or de-energized). Select the conductor for the ground node and click **OK** to add the grounding operation step or click **Cancel** to abort the step.

Adding Comment Steps

You can add comment steps that are not related to a specific device or operation. To add a comment step, select the step after which you want the comment step inserted. Right-click this step, then choose **Insert Blank Step** from the context menu. With the row selected, click in the Operation column to enable adding a description of this step; the Details column is also available for descriptive text.

> **Note**: You may enter text in the Operation, Details, Address, and/or Comments fields. You can also specify Date fields for the step. The other fields are populated automatically when you instruct and complete the step.

Resetting Operation Text

Operation text that has been manually entered may be reset to its original value by following the following steps:

- Right-click to select the row and open the option menu.
- Select **Reset Operation Text**. The **Reset Operation Text** dialog box will open to confirm that you want to change the Operation text back to its original value.
- Click **Yes** to reset the value.

  Note: Click **No** to close the dialog box and leave the Operation text unchanged.

Copying and Pasting Steps

You can copy or cut steps and then paste them to another location within the step list or into another switching sheet. When you cut steps, they are marked as 'cut' in the steps list and are copied into the clipboard. When you copy steps, they are copied to the clipboard, but the original steps are not marked or removed from the list.

The in-order step execution rules are not enforced when cutting and pasting steps. Switching steps that were previously completed can later be cut and pasted into any location within the step list. This also pertains to cutting and pasting steps from one sheet to another.

If you cut and paste steps from one sheet to another, the system determines which events have associations with these steps and automatically moves the corresponding event/sheet associations from the old sheet to the new sheet. If you attempt to move some but not all of the steps for an event, the system displays a confirmation dialog box indicating

the affected events. If you confirm the action, then both the old sheet and the new sheet will have an association to the affected events. Any step moves that affect event associations are recorded in the audit log for tracking purposes.

Follow these steps to use the cut, copy, and paste functions:

1. Select the steps you want to cut or copy.
2. Click the **Copy Steps** or **Cut Steps** button (or right-click the selected steps and choose **Copy** or **Cut** from the context menu).
3. Select the step *after* which you want the steps inserted and click the **Paste Steps** button (or right-click the step and choose **Paste** from the context menu). Any cut steps are moved, and copied steps are duplicated.

   Note: Once the step has been pasted, the Paste button is no longer available and the contents of the clipboard are cleared.

Creating Go-Back Steps

When you are creating a switching sheet in Study Mode, you can automatically generate a sequence of switching steps to "go-back" to the original state. The Go-Back feature creates a new sequence of steps that reverses the existing sequence. For example, assume that Step 1 involves opening a device. If you select this step and choose Copy as Go-Backs, the system creates a step to close that device and copies the step to the clipboard. You can then paste the step in the appropriate location in the step list.

To create go-back steps for one or more steps, do the following:

1. Select the step or the range of steps you want to create reverse actions for.
2. Click the **Copy As Go-Backs** button (or choose **Copy as Go-Backs** from the context menu). Go-Back versions of the selected steps are copied to the clipboard.

   Note: If you selected one or more steps that are part of an aggregate step, all steps within the aggregate are automatically selected and copied as go-back steps. (An aggregate step is an operation, such as Open and Tag, that comprises two or more sub-steps, numbered a through z.)
3. Select the step after which you want the go-back steps inserted and click the **Paste Steps** toolbar button (or choose **Paste** from the context menu). The steps are pasted after the selected step.

Working with Blocks

Blocks are used to organize steps based on stages of execution. A block is a series of contiguous steps that can include both single (ungrouped) steps and groups of steps. The

figure below shows one block that is expanded to display 7 steps and a second block that is collapsed to hide its steps.

Step #	Version	Operation	Device	Phases
Isolate	1			
1	1	Check open S2981	S2981	ABC
2	1	Place HOLD Tag	S2981	ABC
3	1	Open S3142 on phases ABC	S3142	ABC
4	1	Place HOLD Tag	S3142	ABC
5	1	Open S3140 on phases ABC	S3140	ABC
6	1	Place HOLD Tag	S3140	ABC
7	1	Test for potential and apply S/G S3140 on phases ABC	S3140	ABC
Restore	1			

Note the following when working with blocks:

- When you create a new sheet, the system creates an empty block named "Default." When you add steps, they are added to this block by default. You can delete this block and create a new top-level block if you wish.
- The system provides several pre-configured block headers (Isolate, Fault Location, Maintenance, Restore, and Construction); or you can create a custom header. The header is simply the block name that is displayed in the Steps list.
- To expand a block and display its steps, click the + symbol to the left of the block name.
  To collapse a block and hide its steps, click the - symbol.
- All steps within a block must be completed before a step within another block can be completed, unless the block names are the same and the blocks are adjacent (not separated by any blocks of different names). See the **Parallel Step Execution** on page 11-47 for more information about parallel execution of block steps.

Adding a New Block Header

To add a new block header to the steps list:

1. From the Steps tab, right-click the step *after which* you want to insert a block. An option menu appears.
2. Select **Add New Block Header,** then select a block header type: Isolate, Fault Location, Maintenance, Restore, Construction, or Custom.

   Notes:

   - If you choose Custom, you are prompted to enter the block header name.
   - If the only step row in the steps list is the Default block header row and you add a new block header, then the Default block header row will be replaced with the newly added block header row. This is only the case if there are no other steps in the switching sheet.

   A new block header row is added to the steps list.

Renaming a Block Header

To rename a block header in the steps list:

1. From the Steps tab, right-click the block step that you want to rename. An option menu appears.
2. Select **Rename Block Header**, then select a block header type: Isolate, Fault Location, Maintenance, Restore, Construction, or Custom.

   Note: If you choose Custom, you are prompted to enter a new block header name.

The selected block header row is renamed.

Understanding Alerts When Interdependent Blocks are Modified

Switching sheets can be configured to have different block types that are interdependent with one block type being defined as primary and another block type defined as secondary. For example, in the product configuration, **Isolate** is defined as a primary block type and **Restore** is its secondary block type. When a sheet is being transitioned to a new state (for example, going from **New** to **Prepared**), the system checks to see if the primary block was modified after its secondary block was modified.

> **Note:** Modifications could include actions such as adding, deleting, editing (by changing field data), or moving steps. The fields that are checked for modifications can be configured.

If a primary block was modified after a secondary block, the system will warn you that the primary block was edited after the last saved edit to the secondary block. If you click **OK**, the sheet will transition states; if you click **Cancel**, the state transition will not occur and you can review and edit the secondary block steps, as necessary.

Example

You have a new sheet with an **Isolate** primary block and its corresponding **Restore** secondary block. You have created steps to isolate and restore (using **Copy as Go-Backs**). You save the sheet. You add a tag in the isolate block, save the sheet, select the Tracking/Audit Log tab, and click Prepared. The dialog box will tell you that you modified the isolate block after saving the restore block. Click **Cancel** and add the corresponding remove tag in the restore block. Save the sheet. You can now transition the sheet to **Prepared** without being warned.

Parallel Step Execution

Parallel execution allows an operator to direct one crew through a set of steps in one block and another crew through a set of steps in another block. This provides the operator more flexibility when executing switching steps and more closely correlates with their actual business process.

Blocks of steps with the same block names can be executed in parallel when in order step execution rules are enabled (see **Step Order Execution Rules** on page 11-50 for details). The blocks must be sequentially listed and cannot be separated by different blocks of steps. For example, parallel execution is allowed when blocks are ordered (for example, Isolate, Isolate, Restore, Restore); parallel execution is not allowed if blocks are separated by different block names, such as Isolate, Restore, Isolate, Restore.

When executing switching steps, the system checks to see if the previous block step has the same name as the current block step. If it does, the system ignores any incomplete steps within these blocks, but requires that you complete the steps within each block in

order. If steps are grouped within a block, normal grouping rules apply (see **Grouping and Ungrouping Steps** on page 11-48).

The example that follows describes how you might create and execute a plan using parallel step execution:

1. Create a Planned switching sheet.
2. From the Steps list, right-click on the Default block step. Select **Add New Block Header** and then select the Isolate option.
3. Record one or more steps into the Isolate block for a single feeder.
4. Add another Isolate block at the end of the first block.
5. Record one or more steps into the second Isolate block for a different feeder.
6. Create two Restore blocks after the second Isolate block.
7. Create go-back steps for the first of the Isolate blocks. Paste the go-back steps into the first Restore block.
8. Repeat the previous steps to create and paste go-back steps into the second Restore block.
9. In Study mode, complete the first step in the first Isolate block. The step is completed.
10. Complete the first step in the second Isolate block. The step is completed.
11. Continue executing steps in parallel for both Isolate blocks and then both Restore blocks.

    Note: Parallel execution is not required in this situation; it is simply available as an option.

Grouping and Ungrouping Steps

Step grouping allows a sheet type to enforce in or out of order step execution rules for the steps that are grouped. For Product configured switching sheets, grouped steps exhibit the opposite execution rules that non-grouped steps have. If non-grouped steps can be executed out of order, then the grouped steps have to be executed in order; the opposite is true as well. For more information on how these rules are configured for each sheet type, see **Step Order Execution Rules** on page 11-50.

The following rules apply when grouping and ungrouping steps:

- Step groupings cannot cross over Block boundaries.
- Step groupings can be removed and altered (ungrouping and regrouping) at any time. Note that this may impact which steps can be completed next based on step completion rules.

This section includes the following topics:

- Grouping Steps
- Ungrouping Steps
- Adding Steps to an Existing Group
- Grouping Aggregate Steps

Grouping Steps

To group steps:

1. Select two or more contiguous steps. Remember that the grouping cannot cross Block boundaries.
2. Right-click and select **Group Steps** from the context menu. A blue bracket appears in the step number column to visually indicate the newly formed grouping, as shown in the following figure:

Note: Groups cannot span more than one block. If you attempt to group steps that span two or more blocks, the system will create separate groups within each block.

Ungrouping Steps

You can ungroup some or all steps in a group. To ungroup steps:

1. Select one or more steps that are currently part of a group.
2. Click the right mouse button and select **Ungroup Steps** from the context menu.

   The bracket is removed (if all steps were ungrouped) or redrawn to indicate the steps that remain grouped. If the selected steps were in the middle of a grouping, then two new groups are created, and the middle steps are no longer grouped.

Adding Steps to an Existing Group

You can add one or more steps to an existing group as follows:

1. Select the steps you want to add and include at least one step from the existing group.
2. Click the right mouse button and select **Group Steps**.

   The selected steps that were previously ungrouped are added to the existing group.

Grouping Aggregate Steps

An aggregate step is an operation, such as Open and Tag, that comprises two or more sub-steps (numbered a through z). An aggregate step is treated as a single step when grouping and ungrouping steps:

- If you add any sub-step of an aggregate step to a group, then all sub-steps are added to the group.
- If you ungroup any sub-step, then all sub-steps are removed from the group.

Linking and Unlinking a Step to Safety Document

Linking Step(s) to a Safety Document

To link a step to safety document:

1. From the **Steps** tab, right-click to select the step that you want to associate with a safety document.
2. From the context menu, select **Link to Safety Document** and then select a safety document type from the list.
3. The step will be updated to indicate that it is linked to the selected safety document. The associated device will be displayed in the **Tag Points** list of the selected safety document if the step action is part of the safety document's device list filter. For instance, with the Product configuration, it is possible to link an Open step to a safety document. This linking will not cause the associated device to show up in the safety document's **Tag Points** list. This linking has no functional purpose and is just there to allow the actions to be grouped with a particular safety document.

   Note:

   - If the selected step is already associated to a safety document, an error dialog box will be displayed that indicates which safety document the step is associated to.
   - If the selected step type is not configured for the safety document type, then an error dialog box will be displayed indicating the highlighted step number is not valid for linking to the safety document type.

   For a list of step types to valid safety document types, see **Mapping Step Types to Safety Document Types** on page 11-103.

   - To link a safety document to multiple steps, select the steps from the steps list and follow the procedure above.

Removing Links Between Switching Sheet Steps and Safety Documents

1. From the Steps tab, right-click to select the step(s) that you want to remove a link to a safety document.
2. From the context menu, select **Remove Links to Safety Documents**. The step(s) will be updated to indicate that they are no longer linked to the safety document and the devices will also be removed from the safety document's **Tag Points** list.

   Note: For safety documents that have been issued in real-time, the device will be marked for removal, but the reference to the document will not be removed from the step. If the step was linked to the safety document when it was issued in real-time, then that linking cannot be broken from the step.

Step Order Execution Rules

Each of the switching sheet types have step execution rules that either require all the steps to be executed in order or executed out of order. Step grouping has been setup in each of the sheet types, except Outage Correction, to allow step executions to work in the opposite way of non-grouped steps (see **Grouping and Ungrouping Steps** on page

11-48). Outage Correction requires that the steps be validated in order, so out of order execution is not available for that sheet type.

When in-order execution rules are turned on, then the steps have to be instructed, executed, aborted or failed in the order that they are listed in the switching steps list. You cannot complete step 2 before step 1 has been completed, aborted, or failed. When out of order execution rules are turned on, then any step in a non-terminal state can be completed, aborted or failed at any time.

Each switching sheet type is configured with different rules for whether steps can be executed in or out of order normally and then also whether steps can be executed in or out of order when the steps are part of a grouping. The table below describes how each sheet type is configured.

Sheet Type	Execution Rule	Group Execution Rule
Planned	Steps have to be executed in order.	Grouped steps can be executed out of order.
Emergency	Steps can be executed out of order.	Grouped steps have to be executed in order.
Template	Steps have to be executed in order.	Grouped steps can be executed out of order.
Outage Correction	Steps have to be executed in order.	Grouping of steps is not available.

Editing Existing Steps

You can rearrange, add, and delete switching steps using options found on the Steps toolbar or from the Steps context menu.

Notes on editing steps:

- You cannot edit steps while the switching sheet is in the Completed state. You will need to transition the switching sheet to the Rework state to edit the steps after the sheet has been completed.
- Some fields on the switching sheet are not editable after a plan has transitioned to a certain set of states. For example, the Instructed Date and Completed Date fields cannot be updated after the step has reached a terminal state (completed, aborted, or failed). Exceptions to this rule apply when the switching sheet is in the Rework state.
- Tabbing out of a cell can only be accomplished if the cell is not set up for word wrapping.
- The Operation, Details, and Comments columns are configured for word wrapping. Word wrapping means the cell height will grow if the text in the field is too long to be displayed within the confines of the cell width.

To edit switching steps, complete these steps:

1. Open the switching sheet and check the status bar to make sure that the switching sheet is in edit mode.
2. Click on the **Steps** tab.
3. Edit steps as follows:
    - To edit the fields in a step, select the row and click in the Operation (for comment or non-operational steps only), Details, Planned Date, Instructed Date, Completed Date, Comments or Address field and change the text.
    - To insert a blank step, place your cursor in the row after which you want to insert the step and select the right-click **Insert Blank Step** option.
    - To insert a recorded step, select the right-click **Place Step Insertion Indicator** option and then perform the action in the Viewer. Steps are inserted after the step that currently has the indicator. To record steps at the end of the steps list, remove the step insertion indicator first.
    - To delete a step, select the row for the step you want to delete and click the **Delete** button. Attempting to delete a step that is in a terminal state will produce an error dialog indicating that the step cannot be deleted.
    - To rearrange steps, cut and paste the steps to the desired location.
    - You can cut, copy and paste steps from one plan to another. The ability to cut, copy or paste is governed by the sensitivity of the edit options. (The options are disabled if the edit operation is not allowed.)
4. Save the switching sheet by selecting **Save Sheet** from the File menu.

Finding and Replacing a Device in the Steps

The **Device** tab of the **Find and Replace** dialog box allows you to find and replace occurrences of a device in the switching steps. This is helpful for finding a device in a switching sheet that has many steps. You can also use this function if you are reviewing a switching sheet and find that the wrong device was entered in a number of places.

To find occurrences of a device within the Steps list, complete these steps:

1. Open the switching sheet.
2. Click on the **Steps** tab.
3. *(Optional)* Select a step with a valid device name within the Steps list.
4. Click the **Find and Replace...** button on the Steps tab toolbar. The **Find and Replace** dialog box opens.
5. Click the **Device** tab, if not already selected. The Find field displays the selected step's device alias, if an optional step selection was made before displaying the Find and Replace dialog box. Otherwise, enter a device ID in the Find field.
6. Click the **Find Next** button to navigate through the list of steps, highlighting each occurrence of that device.

To replace a device, complete these steps:

1. Open the switching sheet.
2. Click on the Steps tab.
3. *(Optional)* Select a step with a device that you wish to replace.
4. Click the **Find and Replace...** button on the Steps tab toolbar. The Find and Replace dialog box opens. If a device ID was not preselected above, enter a device ID in the **Find** field.
5. Select a device from the Viewer. The **Replace With** field is populated with the device alias. The New Phases column indicates the phase options of the newly selected device. By default, the ALL Phases option is selected.
6. If the device you are replacing is used in a grounding operation, click the **Ground Node** option menu and select the secondary device from the list.
7. Click **Replace**.

   Notes:

   - If you attempt to replace a device for a step when the step action is not valid for the newly selected device, then you will receive a Step Edit Failed error message indicating that the action is not valid for the device type selected. You either need to select a device that is valid for the current step action or use a delete and insert operation to get the step replaced.
   - If you are replacing a device association on a step that has had its Operation text modified, a **Reset Operation Text** dialog box will open asking you if you want to reset the operation text. You will have three options:
     - Click **Reset** to reset the text;
     - Click **Continue** to keep the manually entered Operation text.
     - Click **Cancel** to cancel the device replace.

For more information, see **Resetting Operation Text** on page 11-44.

Finding and Replacing Text in the Steps

The **Text** tab of the Find and Replace dialog box allows you to find and replace occurrences of text in editable fields within the switching steps.

> **Note:** Not all editable fields allow Find and Replace; the project configuration determines what fields are editable. Base Product configuration allows you to find text in the step fields Operation, Device, Details, Executed By, Instructed by, Instructed To, Address and Comments. However, you can only replace text in the editable fields Details, Address and Comments.

To find occurrences of a device within the **Steps** list, complete these steps:

1. Open the switching sheet.
2. Click on the **Steps** tab.
3. Click the **Find and Replace...** button on the **Steps** tab toolbar. The Find and Replace dialog box opens.
4. Click the **Text** tab, if not already selected.
5. Enter the search term in the **Find** field.
6. Click the **Find Next** button to navigate through the list of steps, highlighting each occurrence of the entered search term.
7. To replace an instance of the search term, enter the replacement text in the **Replace with** field and click **Replace**. Repeat as necessary.

   > **Note:** If you attempt to replace text in a non-editable field, a message will notify you that it cannot be replaced.

Changing Start Date

The Change Start Date? dialog box appears when you edit the **Completed Date** of a step that is part of a partial restoration. The outage start times for the related events are not updated. The system does not have enough information to decide which steps should be updated without input.

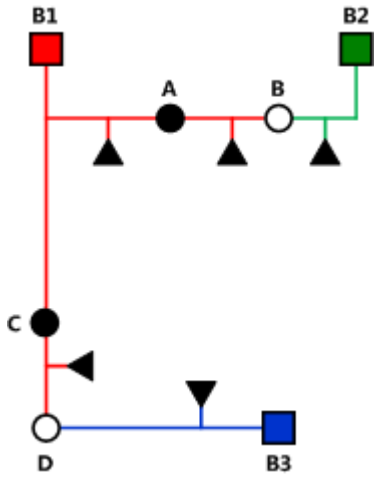
The dialog box allows to select related steps that should also have their outage start time modified. Click **OK** to change execution time or click **Cancel** to abort the change.

Focusing on a Device in a Step

When reviewing a switching sheet, you can focus on a device in the Viewer window to better understand the conditions present in the area of the device. To focus the Viewer window on the device in a switching step, select a step on the **Steps** tab and then select the **Focus** button ( ) on the **Steps** tab toolbar. The Viewer loads the appropriate map and focuses on the device. The **Focus** button can also be used to focus the viewer on a group of devices. To focus the Viewer window on multiple devices, highlight multiple steps with different devices and click the **Focus** button. The Viewer will load the appropriate maps and highlights each device in the viewer.

Example Return to Nominal Scenarios

The following scenarios shows using Return to Nominal for switching actions on the diagram to the right..



Example 1
Simple load balance planned switching action.

1. The user creates a Planned Switching sheet to move load from one feeder to another:
    - Close **B** -- make a parallel
    - Open **A** -- break a parallel
    - Close **D** -- make a parallel
    - Open **C** -- break a parallel
2. The user switches to Real Time mode and executes the steps.
3. The user clicks the button to generate *Return to Nominal* steps.
4. The switching plan will add the following new steps to the bottom of the plan, in a new *Return To Nominal* block:
    - Close **C** -- make a parallel
    - Open **D** -- break a parallel
    - Close **A** -- make a parallel
    - Open **B** -- break a parallel

Example 2
First segment fault emergency switching plan.

1. The breaker B1 trips and creates a Real Outage due to a fault immediately downstream.
2. The user creates an Emergency plan for the outage
3. The new Emergency sheet is created and automatically lists:
    - Open **B1** -- Deenergize a segment
4. In Real Time, the user records new steps to partially restore the areas between **AB** and **CD**:
    - Tag **B1**
    - Open **A** - <blank>
    - Tag **A**
    - Close **B** -- energize a segment
    - Open **C** - <blank>
    - Tag **C**
    - Close **D** -- energize a segment
5. The user clicks the button to generate Return To Nominal steps.

6. The switching plan adds the following new steps to the bottom of the plan, in a new *Return To Nominal* block:
    - Remove Tag **B1**
    - Close **B1** -- energize a segment
    - Remove Tag **A**
    - Close **A** -- make a parallel
    - Open **B** -- break a parallel
    - Remove Tag **C**
    - Close **C** -- make a parallel
    - Open **D** -- break a parallel

Reviewing a Switching Sheet in Study Mode

You can review the actions of a switching sheet in a Viewer window. With the Viewer and the switching sheet in Study Mode, you can complete steps by selecting a step and clicking the **Complete** button on the **Steps** tab toolbar.

As the steps are completed, each one takes effect in the Viewer window and the words "ST Completed" appear in the Status column in the steps section. Steps are completed starting with the first step and continuing sequentially; however, it is possible to complete steps out of order based on the type of switching sheet and whether the step is in a step grouping or not. (See **Step Order Execution Rules** on page 11-50 for more information.)

The Look Ahead window informs you of the results of the operation, including the creation of parallels and loops, the number of critical customers affected, and related abnormal devices and conditions.

Replaying Steps

You can replay steps in the Viewer window, allowing you to experiment with and make changes to a switching sheet. You can then add and delete switching steps and then select one of the three **Reset Study Session** options (see **Reset study session and clear the status of the steps** on page 11-33 for more information). After resetting your study session, you will be able to go through the steps again using the **Complete** button.

Implementing a Planned Switching Sheet

Once you have created, studied, and approved a switching sheet, you can implement the plan. Implementing involves the following steps:

- Scheduling a Planned Master Event
- Issuing a Switching Sheet (includes associating a crew and printing the sheet)
- Instructing and Completing Switching Sheet Steps

Scheduling a Planned Master Event

In order to schedule planned switching, you must have entries within the Start Date and Finish Date (ERT) fields on the **Request** tab. Note that if a Planned Event is partially restored, then the ERT is determined by taking the latest date from the restoration steps *Planned Date* values (see **Planned Date** on page 9-29). If only one of the restoration steps has a Planned Date value, then that value is used even if it is the first step to restore customers. The ERT of the Master event is only used when none of the restoration steps have Planned Date values.

If the Planned event is created after the Master event's estimated restore date, then an ERT for the Planned event cannot be determined. In this case, the ERT will be blank for the Planned event.

> **Note:** The calculated ERT is determined by using the Impacted Customer list, which must be generated for the functionality to work. If the list is not generated, then the ERT of the Master Event is used.

An optional device alias can also be specified within the Device field on the **Request** tab. Specifying a device will cause the planned Master Event to conform to the regular zone authority rules. If you do not have authority over the zone that the device resides in, then you will not see the planned Master Event that will be created when the switching sheet is scheduled.

To schedule a planned Master Event, complete these steps:

1. On the Request tab, fill in future dates and times within the Start Date and Finish Date entry fields.
2. To associate a particular device and control zone, select the device within the Viewer and click the **Link Device** button on the Request tab. If a device is not specified, then the Master Event will fall into the FUZZY control zone.
3. On the Tracking/Audit Log tab, click the button for the **Schedule state**. (If the Schedule button is not displayed, click through the available sheet state buttons until the Schedule button appears.) You can add a comment to each state transition if you wish.

   At this point, a new planned Master Event has been created and associated to the switching sheet. This new event appears in the Events list as a Master Event. You can display the Event Details for the event from either the Work Agenda Events List or the Step tab's Events list.

   Note

   - The **Event Details** display is different for planned and Master events than for spontaneous outage events. For instance, you cannot update the ERT for a Master event from Event Details. That has to be done from the associated switching sheet's **Request** tab. For Planned events, the Event Details Event Began and Event Restored dates are populated through the Completed Date of the associated step in the Planned switching sheet. The Open step's Completed Date will be used for the Event Began time and the Close step's Completed Date will be used for the Event Restored date.

Updating the ERT in Event Details

You can update the ERT for an event to match the date and time specified in the **Finish Date** field on the **Request** tab. The new date will be visible in Event Details the next time you load the event. To update the ERT, complete these steps:

1. Select **Switching…** from the **Actions** menu in the Event Details window. The associated switching sheet is loaded and the steps are displayed.
2. Select the **Request** tab and enter in a new Finish Date (ERT) date and time.
3. Select the **Update ERT** button, which is displayed next to the Finish date and time entry fields. The Estimated Restoration Time (ERT) is changed for the associated Master Event within the Work Agenda Events List. The new date is displayed in the Event Details the next time it is loaded for that event.

   Note: This option is only available after the sheet has been scheduled. This button is displayed next to both the Finish Date and Alt. Finish Date fields. The button is grayed if no date has been entered yet for the field.

Issuing a Switching Sheet

Once you have scheduled the plan, you should associate crews to the planned Master Event and then issue the switching sheet to the crew.

Associating Crews

1. On the Tracking/Audit Log tab, verify that the switching sheet is in Scheduled state.
2. Find the Master Event for a planned switching sheet. (Right-click on the Master Event within the **Steps** tab Events list and click the **Highlight in Work Agenda** toolbar button.)
3. From the **Work Agenda Events List**, select the event. (Even though the event is highlighted, you must click on the event in the Work Agenda Events List in order to assign and dispatch crews to events.)
4. From the **Crew Actions** list, select the crew and then click the appropriate option on the **Actions** menu: **Assign** or **En Route**. The Crew is listed in the Crew List on the Steps tab header, and the selected status is shown.

Releasing Crews from an Event

To release one or more crews from an event, select the master event in the **Work Agenda** and select **Release Crews...** from the **Actions** menu. The **Release Crews** window opens with a list of all crews assigned to the selected event. One or more crews may be selected:

- Click on a crew name to select one crew.
- Click, hold, and drag to select multiple adjacent crews.
- Control-click to select multiple non-adjacent crews.

Once the crews have been selected, click **Release** to release the crews from the event. The Release Crews window will close, the crew will no longer be associated with the event, and the crew symbology will disappear from the Viewer.

Pre-Assigning Steps to Crews (Optional)

You can pre-assign steps to crews before issuing the switching sheet. With pre-assigned switching steps, the crew is automatically highlighted in the Crew List as the steps are instructed and/or completed. To pre-assign steps to a crew, select the appropriate steps and then select the crew from the Crew List found on the Steps tab. (To select all the steps, select a single step and then press Control-A.) The Instructed To field for the selected steps is updated with the crew"s ID.

> **Note:** To clear (deselect) crew step assignments, select all the steps again, then press the Control key and click the crew in the Crew List. The Instructed To column is cleared for all steps that have not been instructed, aborted, failed or completed. Alternatively, right-click the selected steps and choose **Clear Crews** from the context menu or select the option from the **Actions** menu.

The plan is now ready for the crews to work the steps.

> **Note:** To pre-assign each step to multiple crews, simply select more than one crew in the Crew List before selecting your steps.

Changing the Sheet State to Issued

When the plan is issued to the crew, change the sheet state to **Issued** on the **Tracking/ Audit Log** tab. The sheet can now be printed (see the following section) and handed to the crew or sent via email, depending on how your crew assignments are handled.

Adding and Removing Event Associations

Click the **Add Event Association** button ( ) in the **Steps** tab header to associate an event with the switching plan. You can enter the event number or select an event in the Work Agenda Event List. The event will show up as a "Manual" associated event within the Events list.

Click the **Remove Event Association** button ( ) to remove an event association from the switching plan.

See **Event Associations** on page 11-98 for more information.

Printing the Switching Sheet

To print the switching sheet:

1. Select **Print...** from the **File** menu (or click the **Print** ( ) button on the main toolbar).
2. Select each section of the switching sheet you want to print:
    - Request
    - Events and Crews
    - Switching Steps
    - Impacted Customer List
    - External Documents
    - Safety Documents
    - Audit Log
3. Select the format for the print-out:
    - PDF
    - HTML
    - RTF
    - XML
4. Verify that your printer is selected and click **Print**.

Instructing and Completing Switching Sheet Steps

Once you have scheduled and issued a switching sheet, you are ready to instruct and complete the switching sheet steps. Instructing a step indicates that you have provided the step information to the individual performing the switching actions in the field.

Overview

Note the following key information about instructing and completing steps:

- Instructing steps is only permitted in real-time mode.

- In order to begin instructing switching sheet steps, the sheet has to be Issued first. The Instruct and Complete buttons become enabled in real-time mode when the plan reaches the Issued state.
- The order that steps can be instructed depends on the type of sheet the steps are found in and whether the steps are part of a step grouping or not. (See **Step Order Execution Rules** on page 11-50.)
- Steps are not required to be instructed before being completed. It is up to you to decide if the step should be instructed first.
- To complete a switching step, the switching sheet must be in real-time mode. (You can complete steps in Study Mode, but these actions do not affect the real-time data model.)
- Although a Viewer window does not need to be open to complete switching steps, it is helpful to view the step actions in a Viewer window. The Viewer must be in real-time mode as well.
- For steps involving device operations, you must have authority over the zone where switching operations will take place, or the system will not allow you to complete the switching steps.
- If you attempt to operate a device to its current state, such as closing a device that is already closed, a dialog box informs you that the device is already in its desired state. You can continue or cancel the operation. If you continue, the system marks the step as completed or instructed (depending on your action). If you cancel, no action is taken.

Instructing and Completing Steps

To instruct and complete steps:

1. Verify that the switching sheet and the Viewer are in real-time mode.
2. On the Tracking/Audit Log tab, verify that the status of the sheet is Issued, In Progress, or Hold/Pending.

Instructing the Step

3. Select the step you want to instruct.
4. If a crew was assigned to the switching plan and was not pre-assigned to any steps, then select the crew from the Crews List in the Steps tab header. (See the previous sections for instructions on associating crews to switching sheets and pre-assigning steps.)

   Note: Automatic crew list selection is based on the crew specified in the Instructed To field of the selected step. If the step does not display a crew in this field, then no crew will be selected in the Crews List.

5. When you give the instruction to the crew, click the **Instruct** button on the Steps tab toolbar.
6. If the step involves a device operation, the Look Ahead window opens. Click **Open** or **Close** in the Look Ahead window to continue with the step. (You may be required to view conditions associated with the operation before you can perform the operation.)

The status of the step changes to Instructed. The Instructed To column is populated with the assigned crew"s ID, and the Instructed Date column is populated with the current date/time. An Instructed symbol appears on the device in the Viewer.

If the step involves issuing a safety document to one or more crews, then the list of crews in the step"s **Instructed To** field will be used to populate the **Assigned Crews** list within the safety document when the step is completed.

Notes on SCADA Actions

- If the step involves actions on a SCADA control, a confirmation dialog box displays the following text: "Do you wish to send this request to SCADA?" If you click **Yes**, the step is instructed to SCADA, the request is sent to SCADA, and the status of the step is set to SCADA Pending. If you click **No**, the request is not sent to SCADA and the step is set to SCADA Pending (it will wait for telemetry in order to complete the step). This may be the case if a crew were instructed to perform the operation instead of a SCADA system. If you click **Cancel Action**, the operation is canceled.
- If the SCADA interface reports that the device was indeed opened, the step status is then updated to Completed. The switch opens in the Viewer and the instruct condition disappears.
- If you select the Complete button before receiving information from SCADA, a confirmation dialog box displays the following text: "SCADA telemetry only for selected device. Submit a manual entry?" If you click **Yes**, the status of the step is set to Completed, and the switch opens with status of M (for MANUAL entry) in the Viewer. If the SCADA interface reports that the device was indeed opened, the MANUAL indicator disappears. If you click **No**, the action is canceled.

For more information about SCADA, see **SCADA Extensions** on page 10-1.

Notes on the Look Ahead and its Errors and Warnings

When instructing a step, the Look Ahead and its associated errors and warnings display data as if the other instructed steps in the sheet were already completed. This allows you to instruct multiple steps, including go-backs of previous steps, without receiving errors about missing tags, incorrect statuses, and so on. This will also give you the correct customer count as if the other instructed steps were already executed.

This considers all instructed steps in the current sheet only and applies them to the model in the order that they were instructed (using the Instructed Date field.)

Completing the Step

7. After the crew reports that the step is complete, select the step and click **Complete**.

   The Status is updated to *Completed*. The Completed Date column is populated and the device status is updated in the Viewer window. If customers are impacted, then a new planned outage event is placed upon the device as well. This event will also appear in the Events list on the **Steps** tab header.

8. If the step is a safety state transition step, then selecting **Complete** will cause the safety document dialog box to be displayed. Verify that the information on the safety

document is correct and click the **Execute** button at the bottom of the display to complete the action. (For more information, see Executing Safety State Transition Steps.

Note: All safety documents must be completed before you can complete the switching sheet. Also, in order to complete an Issue Safety State transition step, a crew must be specified in the **Assigned Crews** list. You can specify a crew by doing one of the following:

- Select one or more crews within the Crew List on the **Steps** tab. Use these selections to populate the **Instructed To** field of the safety state transition step. Upon completing the step, the crews listed in the **Instruct To** field will also be listed in the safety document"s **Assigned Crews** list.
- Click the **Select Crews...** button ( ) found above the **Assigned Crews** list on the safety document and use the Select Safety Crew dialog box to populate the **Assigned Crews** list.

9. Repeat steps 3-8 for each switching step you want to instruct and complete.

Recording Additional Steps in Real Time

10. Additional steps may be added to the switching sheet in real time when it is in the 'Issued" state. Click the record button and proceed to record the actions as issued.

Completing the Switching Sheet

11. When all steps have been completed, click the **Tracking/Audit Log** tab and set the sheet state to *Completed* by clicking **Complete**. The **Confirm State Transition** dialog box will open; click **Yes** to confirm the completion or click **No** to close the dialog box without completing the sheet. The Finish Date may be updated, if necessary.

    - *Optional*: add a comment in the text field to the right of the **Complete** button.

    If any associated event has not been restored or if any safety document has not been completed, an error message is displayed indicating that the sheet cannot be completed.

    Once the sheet is in the Completed state, any planned outage events are completed along with the planned master event. Any crews assigned or en route to the events are released as well.

    Note: Once all the steps in a switching sheet are complete, the plan itself is considered complete. Setting the sheet state to Completed "locks" the switching sheet so that no further modifications may take place while it is in this state.

Moving a Crew

Crews are automatically relocated as steps are instructed to them. As steps are completed, crews are moved to the appropriate device based on the remaining instructed and non-complete switching steps. If all steps have been completed, the crew is moved back to the master device or the previously operated device, depending on the configuration. (If configured to go back to the master device and one is not given, then the crew disappears from the Viewer.)

You can manually move a crew to the device associated to the selected switching step. This option is available only if the step is instructed and has been instructed to a crew. This option allows you to move a crew to a different device when multiple steps have been instructed to a crew.

To move a crew to a device, follow these steps:

1. Associate the crew to the planned switching sheet as described in Associating Crews.
2. Transition the sheet to the Issued state, if it is not already.
3. Select the crew within the **Crew List** on the **Steps** tab header.
4. Instruct all steps in the sheet. Note that within the viewer, the crew initially moves from master device to the first instructed device and then to the next.
5. From the **Steps** tab, select an instructed step, right-click, and select **Move Crew** from the context menu. The crew moves to the device associated to the selected step.

Working with Switching Sheet Versions

Switching sheets use a version control mechanism in order to keep operators and crews consistent with regards to which switching sheet they are viewing. The switching sheet as a whole has a version number, and steps can also have version numbers.

Each switching sheet version will go through a set of states.

- **Editing:** The current version of the sheet is being edited.
- **Checked In:** The current version of the sheet has been checked in. Any updates to the sheet other than instructing and completing steps will cause a new version to be created and that version will be in the Editing state.

The following describes how sheet version control works and presents examples of how the version and editing mode change as actions are taken on a switching sheet.

- When you first start a sheet, the sheet version is 1. The sheet's version number and editing state are displayed in the Status Bar at the bottom of the switching sheet. The new sheet's version is considered to be in an Editing state until it is checked in.

Action	Resulting Version and Editing Mode
Initial sheet is created	Version: 1 (Editing)

- When the sheet transitions to Issued state or whenever a switching step is instructed or completed in real-time mode, the system automatically checks in the current version of the switching sheet, but the version number is not incremented until you make changes, which will create a new version.

Action	Resulting Version and Editing Mode
Sheet transitions to Issued State, triggering automatic check-in	Version: 1 (Checked In)

- If you make switching step changes after the sheet has been checked in or change any field in the sheet, the system automatically creates a new version and increments the sheet's version number.

  Note: Your system's configuration determines which fields trigger a version change when edited. By default, a new version is created when any field is changed.

Action	Resulting Version and Editing Mode
Steps are added, triggering version update	Version: 2 (Editing)

- You can manually check in changes at any time. This creates a saved version of the sheet that you can refer back to later. It also makes the checked-in version available to other users who view the sheet. The **Check In** button is displayed in

the sheet's toolbar; when you click the button, the current version is checked in, and the **Check In** button changes to **Create New Version**.

Action	Resulting Version and Editing Mode
User manually checks in version, using Check In Version option	Version: 2 (Checked In)

- You can manually increment a sheet's version after the sheet has been checked in using the **Create New Version** button. When you manually increment the version, the system creates a new version of the sheet and places that version into an Editing state.

Action	Resulting Version and Editing Mode
User manually increments version using the Create New Version option	Version: 3 (Editing)

- You cannot make changes to a switching sheet while it is in the Completed state. Once a sheet is completed, it will be placed into view-only mode. Further corrections can be applied to the Completed switching sheet by transitioning it to the Rework state. See **Rework** on page 11-24 for more details.

Step Versioning

Steps also have version numbers. The step version number is the version number of the sheet when the step was added. A step's version number is displayed on the **Steps** tab to the right of the step number.

- If you add steps to a checked-in switching sheet, the sheet version is automatically incremented and the newly added steps are associated to this new sheet version number. This allows you to easily distinguish between steps that were previously issued to a crew and newly added steps.
- To see the differences between the current version and a previous version, open the version drop-down list on the status bar, then select the version to compare against.

When you select a version, the Step # column uses outline numbering (1.1, 1.2) to identify steps that were added since the previous version.

If you delete a step when the switching sheet version is checked-in or when an earlier version of the step exists, then the step is removed from the current version. If you

view a previous version in which the step existed, the deleted step is indicated with strikethrough text and is shaded red.

Step #	Version	Operation	Device	Phases	De
Isolate	1				
1	1	Check open S2981	S2981	ABC	
1.1	2	Place CLEAR Tag	S2981	ABC	
2	~~1~~	~~Place HOLD Tag~~	~~S2981~~	~~ABC~~	
3	1	Open S3142 on phases ABC	S3142	ABC	
4	1	Place HOLD Tag	S3142	ABC	
5	1	Open S3140 on phases ABC	S3140	ABC	

Viewing Impacted Customers

The **Impacted Customers** tab displays a list of all customers affected by the switching step operations. It also shows the total number of customers in the interrupted, isolated, and restored states:

- **Interrupted:** customer had power at the start of the switching operation, lost power (at some point) during the operation, and had power again at the end of the operation.
- **Isolated:** customer had power at the beginning of the operation and had no power at the end of the operation.
- **Restored:** customers who were without power during the operation and had power at the end of the operation.

Important Note:
Service Alerts for planned events are triggered by the Impacted Customers List. Alerts will not be sent if the Impacted Customers List is not generated.

Note: Customers marked as *Deleted* will not be included in the Interrupted, Isolated, or Restored total number counts.

The following rules apply to the Impacted Customer list:

- Whenever the system determines that a plan will impact customers, the Impacted Customers indicator is displayed on the status bar. If the sheet is later changed and customers are no longer impacted, then the indicator is removed.
- If a customer will be impacted multiple times during a sheet's execution, the customer is listed multiple times in the list.
- If no Planned Dates are specified for the device operations relating to an item in the list, then the dates will come from the sheet's Start and Finish Dates, which are required to generate the impacted customer list. The only exception to this rule is when working with Outage Correction sheets, which require step control times.
- The list can only be regenerated in study mode, since it displays the list of customers that will be impacted when the plan is executed and it uses your study session to calculate that list. See **Generating the List** on page 11-70 for more details.
- The list is not affected by the Real-Time execution status of the steps. The Work Agenda, Event Details, and Event Log are the source for Real-Time outage data.

- If multi-phase customers are affected by individual phase operations, they will be listed once for each phase dropped and the restore time will be the time they were **fully** restored (the last restoration step).

Using the Impacted Customers Tab

The Impacted Customers tab displays a list of impacted customers in a hierarchical, or tree, format -- just like Windows Explorer. The top level of the hierarchy is date/time the customer is impacted. Within date/time, the list displays each supply node along with the restore date/time. Within each supply node is a list of customers. You can expand or collapse any level of the hierarchy by clicking the + or - icon.

The Impacted Customer list displays the following fields and buttons:

- **# Interrupted** displays the number of customers who will be interrupted (Isolated and Restored) by the operations performed in this switching sheet.
- **# Isolated** displays the number of customers who will be isolated by the operations performed in this switching sheet.
- **# Restored** displays number of customers who will be restored by the operations performed in this switching sheet.
- **Name** displays different values depending on the type of row being displayed. There are three levels of information in the list:
  - **Impact Date** (level 1) displays the date the customers will be impacted. If the customers are not impacted by the switching steps in this switching sheet, but are being restored, then this date will be the start date of the switching sheet.
  - **Supply Node/Transformer and Restore Date** (level 2) displays the transformer alias the customer is found on within the model, followed by the Restore Date. The Restore Date is based on the Planned Date for the device or, if no Planned Date was specified, the Finish Date of the switching sheet. Isolated transformers display "No Restore Date".
  - **Customer Name** (level 3) displays the customer's name.
- **Account Numbe**r displays the customer's account number.
- **Meter Number** displays the customer's meter number.
- **Critical** displays whether the customer is a critical customer or not.
- **Address** displays the customer's street address.
- **City** displays the customer's city.
- **Zip** displays the customer's zip code.
- **Phone** displays the customer's phone number.
- **Result** displays the result of the impact, such as Restored or Interrupted. If a delete operation is initiated against a customer in the list, then the **Result** field will have a value of Deleted.

Buttons

- The **Rebuild the Impacted Customer List** button ( ) regenerates the list based on the most current information in the switching sheet. Each time you rebuild the list, it is saved to the database. The application uses your Study mode to apply the step actions and to determine the Impacted Customers. Your study model should be set up or reset appropriately before generating the list. This button is only enabled when the switching sheet is in Study mode.
- The **Move Customers to a Different Device** button ( ) initiates the Move Customers dialog box for selected customers. See **Moving Customers** on page 11-71 for information.
- **Mark Customers as Deleted** button ( ) marks the customers selected in the table as deleted.
- The **Reset all Deleted Impacted Customers** button ( ) resets all impacted customers that were previously marked as deleted in the list.
- The **Export Impacted Customers List** button ( ) opens the Report Format dialog box, which allows you to select an output format. Options include CSV (comma separated values) and XML. Once the report is generated you will be asked where to save the file; select a location on your local PC and click the **Save** button.
- The **Print Preview** button ( ) opens the Report Format dialog box, from which the output format can be selected. The output will include the switching sheet header information and the Impacted Customer list.
- The **Print** button ( ) opens the Report Format dialog box, from which the output format can be selected. A hard copy of the switching sheet header information and the Impacted Customer list will be generated on the printer you select.
- The **Email** button ( ) opens the Report Format dialog box, from which the output format can be selected. An email composition window is generated with attached impacted customers list file named **sheet-type_sheet-#_ImpactedCustomers.format** and subject `Switching Sheet: <sheet-type> <sheet-#> (Impacted Customers).`

  For example:

  Subject: Switching Sheet: Planned 1079 (Impacted Customers).
- The **Focus** button ( ) focuses the primary Viewer on the selected device.
- The **Show Critical Customers** button ( ) filters the list to show only critical impacted customers; when toggled off, all impacted customers will again be shown.

Color Coding

Rows (customers) on the list are color-coded to show the status:

- Green - Restored
- Orange - Isolated

- Red - Deleted
- No background - Interrupted

Generating the List

To generate the Impacted Customer list, follow these steps:

Important Note:
Service Alerts for planned events are triggered by the Impacted Customers List. Alerts will not be sent if the Impacted Customers List is not generated.

1. On the Request tab, verify that a Start Date and Finish Date have been entered for the sheet. The system uses these fields to generate the Impacted Customer list and the estimated restoration time for each customer. The start of outage is the Start Date of the switching sheet, and the restoration time is the Finish Date.

   Note: If a Planned Date is specified for a particular operation on the Steps tab, then the Planned Date, rather than the sheet's Start and Finish Date, is used to generate the impacted customer list for that operation.

2. Make sure that you have added all necessary steps to the switching sheet, and that the sheet is ready to be worked. The steps do not need to be completed to produce the list.
3. On the Steps tab, click the **Reset Study Session** button on the toolbar, then select **Real-Time** or **Nominal**. At this point, you can update your study session within the Study Viewer to depict what the model will be like when the work is carried out.
4. On the Impacted Customers tab, click the **Rebuild Impacted Customer List** button on the toolbar. The list is generated and displayed.

   Notes:

   - When the steps do not impact any customers, clicking this button will bring up an information dialog box stating that no customers will be impacted as a result of the operations in the current switching sheet.
   - If you do not reset your study session as described in step 3, then the impacted customers list may end up with no results. This is due to the fact that the steps in the sheet, when traced through, will not actually impact any customers in your study session. This is why it is vital that you prepare your study session before attempting to generate the impacted customers list.

Sorting Impacted Customers List

The Impacted Customers list can sort by clicking on a column header. By default they are sorted by impacted date and customer name in ascending order. Click once to sort them in descending order. An icon on column header indicates the current sort column and sort direction; the up arrow ( ) indicates ascending order; the down arrow indicates descending order. Printed output, through print-preview and print options, use the default sort order.

Deleting and Restoring Customers from the List

To remove a customer from the list, right-click the customer and select **Delete** from the context menu. The row is highlighted in red.

Note: Removing the customer from the list does not remove the customer from the model; it simply marks the customer as deleted from

the list. If you regenerate the list, the customer will still be marked as deleted. If the customer is impacted multiple times, then that customer will be marked as deleted in each of the lists.

To restore (un-delete) a customer, right-click the customer and select **Undelete** from the context menu.

To restore all previously deleted customers, click the **Reset all Deleted Impacted Customers** button. All red highlighting is removed.

Moving Customers

If you realize that customers have been incorrectly associated with a device, you may need to move them from a device that will be impacted to a device that will not be impacted. To move customers from their current device to another device, complete these steps:

1. On the Impacted Customers tab, select the rows for the customers you want to move.

   Note: The expandable folder nodes are not selectable; you must select customer names.

2. Right-click and select **Move Customers...** from the context menu. The Move Customers dialog box opens, displaying the customer names, addresses, and their original device as defined by CIS.

   Note: If you click the **Move Customers...** button without first selecting customer rows, you will receive an "Invalid Customer Selection" error with the message: Only customer rows selected are considered by the Move Customer feature. Any selected expandable folder nodes are ignored. Select at least one customer row to continue.

3. Click on the new device in the Viewer. The New Device field on the Move Customers dialog box is populated with the selected device.

4. Click **OK**. The system determines whether or not the new device is also an impacted device.

   If the new device is not an impacted device, the customers are moved to the new device and are removed from the impacted customer list.

   If the new device is an impacted device, a confirmation dialog box is displayed. Do one of the following:

   - Click **Yes** to continue with the move. The customers are moved to the new device within the Impacted Customers list. If the selected customers were previously moved to a new device, another confirmation dialog box is displayed. Do one of the following:
     - Click **Yes** to continue with the move. The existing customers move record is overwritten.
     - Click **Cancel** to return to the Move Customers dialog box so you can select a different device.
     - Click **No** to cancel the move and close both the confirmation dialog box and the Move Customers dialog box.
   - Click **No** to return to the Move Customers dialog box so you can select a different device.

- Click **Cancel** to cancel the move and close both the confirmation dialog box and the Move Customers dialog box.

Checking for Overlaps

Once you have created steps for a planned event, generated the Impacted Customers list, and saved the switching sheet, you can cross-check the switching sheet with other switching sheets for overlaps of time, control zone, or affected devices.

This allows planners to create a single planned event instead of two separate events and avoid visiting the same location twice or impacting the same customers twice within a short time frame. Planners can identify whether to change the current switching sheet in order to avoid affecting the same customers or same area multiple times in a certain time period.

> **Note:** When an overlap occurs, the system does not prevent you from completing planned switching operations, but it does provide a warning indicating the overlap.

If the current plan has a time, control zone, or device overlap with another plan, the Overlap indicator is displayed on the switching sheet Status Bar. Use the Overlaps tab to view details about the overlaps.

Using the Overlaps Tab

The Overlaps tab displays the following fields and buttons:

- The **Update Overlaps** button () updates the Overlaps list based on the current settings.
- The **Range** drop-down list allows you to specify how to use the From and To dates. Options are:
  - Sheet Start and Finish Dates
  - +/- 1 day
  - +/- 1 week
  - +/- 1 month
  - +/- 1 year

  For example, if you select Sheet Start and Finish Dates, the system updates the From and To dates to match the sheet's Start and Finish dates entered on the Request tab. If you select +/-1 week, the system displays overlaps that are one week before and after the sheet's Start and Finish dates. In other words, overlaps for a two week period plus the switching sheet's scheduled duration will be used to search for overlaps.
- The **From and To** fields specify the range of dates for which you want to view overlaps. These fields are automatically populated based on your selections in the Range field. If you manually enter values in the **From** and **To** fields, those values will override what was auto-populated by the Range selection.
- The **Filter By** drop-down list allows you to specify the type of overlaps you want to view: Device, Control Zones, or Time. See **Updating the Overlaps List** on page 11-74 for details.

- The **Open Selected Switching Sheet** button ( ) will open the switching sheet selected in the overlaps list. Alternatively, you can right-click on the switching sheet and select **Open Switching Sheet** from the option menu.
- The **Export Table** button ( ) is used to export a comma separated value list of the table contents to a file.
- The **Overlaps** table displays a row for each switching sheet that has an overlap with the active switching sheet (and meets the criteria specified above). The blank filter boxes at the top of each column allow you to filter the Overlaps list. See **Viewing an Overlapping Switching Sheet** on page 11-74 for details.
  - The **Overlap Type** column displays the type of overlap the sheets have with the switching sheet the list is being generated from. Values include Device, Control Zone, Time. When looking for overlaps in the past, it is possible to also display sheets with overlap types of Past Device, Past Control Zone, and Past Time. These "Past" types indicate switching sheets that have Finish dates that are in the past, but are still active.
  - The Status column displays the status of the switching sheet listed on that row.
  - The **Sheet #** displays the switching sheet number that contains the overlaps.
  - The **Type** column displays the type of switching sheet.
  - The **# Steps** column displays the total number of steps included in the switching sheet. This number basically matches up with the last step number in the sheet's Steps list and does not include child aggregate or Block steps.
  - The **# Devices** column displays the number of device overlaps.
  - The **# Zones** column displays the number of overlapping control zones.
  - The **# Hours** column displays the number of hours the sheet overlaps with the current sheet. This value is based on the dates specified in the Start and Finish date fields on each of the switching sheets.
  - The **# Supply Nodes** column displays the number of impacted nodes shared by the two switching sheets. For this column to display a value, the impacted customers list will have had to have been generated for the current switching sheet and the one listed in the Overlaps list.
  - The **User** column displays the user ID of the requester of the switching sheet.
  - The **Start Date** column displays the start date of the switching sheet.
  - The **Finish Date** column displays the finish date of the switching sheet.
  - The **Feeders** column is the Feeder value as displayed on the **Request** tab of the switching sheet.
  - The **Description** column is the **Description** value as displayed on the **Request** tab of the switching sheet.

The list on the Overlaps tab supports Quick Sorting and Dynamic Filtering.

Color Coding

Rows on the Overlaps tab are color coded to indicate the type of overlap. The **Overlap Type** column also describes the overlap type:

- **Dark Gray (Past)**: the switching sheets have an overlap, but the overlapping times on the sheets are in the past. To distinguish between the types of past overlaps, the foreground coloring will be set to Red, Orange, or White based on the type of past overlap it is. These colors have the same meaning as the background colors used to define the type of overlap for future overlaps. See the following color definitions for more details.
- **Red (Device)**: The switching sheets have device overlaps.
- **Orange (Control Zone)**: The switching sheets have control zone overlaps.
- **White (Time)**: The switching sheets overlap in time only.

Updating the Overlaps List

Use the fields at the top of the Overlaps tab to re-generate the Overlaps list for a different time period or to show different types of overlaps.

To update the Overlaps List:

1. Use the **Range** and **From/To** dates (for device and control zone overlaps) to specify the time period for which to display overlaps.
2. From the **Filter By** drop-down list, select the type of overlaps you want to list. For example, if you want to show only switching sheets that have device overlaps within a specified date range, select **Devices** from the drop-down list.
3. Click the **Update Overlaps** button () to refresh the list based on your selections.
4. Standard filtering and sorting options are available for the results list.

Viewing an Overlapping Switching Sheet

To view an overlapping switching sheet, double-click on the entry within the Overlaps List. The switching sheet opens in a new tab. Alternatively, you can right-click on the entry and select **Open Switching Sheets...** from the context menu.

Saving and Loading View Areas

While working with a switching sheet, you may often want to return to the same area of the map. Web Workspace allows you to save an area of the map, called a view area, so that it can be loaded again later. This allows you to quickly focus the Viewer on a particular section of the model.

You can save multiple view areas for each Viewer. You can assign a description to each view area that identifies its contents and purpose. You can also select a saved view area to be loaded automatically into a Viewer when the switching sheet is opened.

Using the View Areas Tab

Use the **View Areas** tab to save and load view areas. The first row in the **View Areas** table contains a special *Dynamic View* (**All Devices**) that contains all devices associated with the switching sheet; as devices are added in steps, the dynamic view is automatically updated to include those devices.

The **View Areas** tab displays the following fields and buttons:

- The **Auto-Load in Viewer** drop-down list allows you to assign a view area to a Viewer, which will then load that view whenever the sheet has focus. Note that the auto-load function does not open the Viewer so you must start the Viewer to see the view areas.
- **Description** is the description of the saved viewing area. The default description is "View Area #," where "#" is a uniquely generated ID number. You can change this description up until the associated switching sheet has reached the Completed state. The All Devices (Dynamic View) description is not editable.
- The **Save View Area 1** button ( ) allows you to save the map area that is currently displayed in Viewer 1.
- The **Save View Area 2** button ( ) allows you to save the map area that is currently displayed in Viewer 2.
- The **Load View Area on Viewer 1** button ( ) allows you to load the selected viewing area to Viewer 1.
- The **Load View Area on Viewer 2** button ( ) allows you to load the selected viewing area to Viewer 2.
- The **Delete View Area** button ( ) allows you to delete the selected viewing area.
- The **Reload All Viewers** button ( ) allows you to reload all viewing areas marked for auto-loading.

Saving a Viewing Area

To save a viewing area, complete these steps:

1. In the Viewer window, navigate to the area of the map that you want to save as a viewing area.
2. On the **View Areas** tab in the Web Switching Management window, click one of the **Save Map** buttons on the toolbar.

- Click the **Save View Area 1** button ( ) to save the map area that is currently displayed in Viewer 1.
- Click the **Save View Area 1** button ( ) to save the map area that is currently displayed in Viewer 2.

The new view area is added to the bottom of the list of saved views on the View Areas tab.

3. In the **Description** field, enter a meaningful name that describes the viewing area.
4. If you would like this viewing area to be loaded automatically the next time this switching sheet is opened, select the **Viewer** from the **Auto Load in Viewer** drop-down list.

Note: The application will only allow you to select one saved viewing area to be auto-loaded for each Viewer.

Loading a Saved Viewing Area

After a viewing area has been saved for a switching sheet, you can quickly load the viewing area into the Viewer window.

To load a saved viewing area, complete these steps:

1. On the **View Areas** tab, select the viewing area you want to load.
2. Click the appropriate button to load the viewing area into the desired Viewer (or use the right-click context menu options):
   - Click **Load View Area on Viewer 1** button ( ) to load the selected viewing area to Viewer 1.
   - Click **Load View Area on Viewer 2** button ( ) to load the selected viewing area to Viewer 2.

The selected viewing area is displayed.

Note: If the Viewer you selected is not running, a message is displayed.

Reloading all Auto-Load Viewing Areas

Click the **Reload All Viewers** button () to reload all viewing areas marked for auto-loading. (The Auto Load in Viewer column indicates which viewing areas are specified for auto-loading in each Viewer.)

Note: If no Viewers are running, a message is displayed.

Deleting a Saved Viewing Area

To delete a saved viewing area that you no longer need, complete these steps:

1. On the **View Areas** tab, select the viewing area you want to delete.
2. Click the **Delete** button ( ). The viewing area is removed from the list. The **All Devices** dynamic view area cannot be deleted from the list.

Viewing the Audit Log

The Tracking/Audit Log tab displays the current state of the switching sheet and allows you to transition to a different state. You can provide comments to explain the reason or circumstances around the transition in the Sheet State Tracking pane. See **Changing the Switching Sheet State** on page 11-23 for more information, including valid switching states.

The Audit Log table contains a list of status changes the sheet has gone through since it was created. An entry is added to the log whenever changes occur to the sheet state, including (but not limited to) status changes, sheet ownership changes, generation of the impacted customer list, and sheet version check-ins.

The Audit Log table contains the following fields and buttons:

- **Entry Date** displays the Date and Time when the change was made.
- **Sheet Version** displays the version of the sheet when the change was made.
- **Sheet State** displays the state of the sheet when the change was made. (See **Switching Sheet States** on page 11-25 for state descriptions.)
- **Entry By** displays the user who initiated the change.
- **Details** displays a brief description of the audit entry.

  Note: You cannot change any information for existing entries in the audit log table.

As with other list displays, you can click and drag column headers to rearrange the order of columns. You can also re-sort the list by clicking on the Entry Date column header. By default, log entries are displayed in ascending chronological order.

Adding a Comment to the Audit Log

The Comment section of the Audit Log pane allows you to add a comment to the log.

1. Click in the Comment field and enter a comment. The **Add** button () will be enabled.
2. Click the **Add** button () to add the comment to the log.

Emailing Switching Sheet Data

At any time during the process of editing or viewing a switching sheet, you can email the switching sheet data to one or more recipients. The switching sheet data will be sent as an email attachment in a chosen file format.

> **Note**: Your email client will be used for sending the email. Depending on your email client, some attachment behavior may be different than described. If you do not have an email client installed and set up on the PC from which you are running Web Workspace, you will not be able to email switching sheet data.

1. Click the **Email...** button ( ).
2. From the **Switching Report - Content Selection** dialog box, check the box for each section you want included in the email data:
   - **Request**

- **Events and Crews**
- **Switching Steps**
- **Impacted Customer List**
- **External Documents**
- **Safety Documents**
- **Audit Log**

3. Choose the email format: **PDF**, **RTF**, **HTML**, or **XML**.
4. Click **Email...**.
    - The Subject field is automatically populated; you can edit this field if you wish.
    - The selected data is attached to the email.

    Note: Depending on your configuration, you may be given the option to name the switching sheet data attachment prior to the file's attachment; the standard configuration will always name the file according to the sheet type and number (for example, Planned_1003.pdf).
5. (Optional) Enter any text you want to include with the message.
6. **Send** the message according to your email client's functionality.

Automatic Emails

Based on your system's configuration, emails can be automatically sent to an individual recipient or group and to the requesting user. Automatic emails are normally initiated after a switching sheet state change. For example, if a plan is rejected, the requesting user will be sent an email message indicating that the request was rejected and the reason for the rejection. Product configuration does not have this functionality enabled by default. Projects will be required to enable this feature in order to use it.

Adding External Documents to a Switching Sheet

Use the External Documents tab to attach supplemental documentation to the switching sheet. External Documents are stored in the database, so shared file systems are not needed.

Note: External Document files may be images (for example, jpg, png, bmp), documents (for example, doc, docx, odt), spreadsheets (for example, xls, xlsx, ods), and so on.

Using the External Documents Tab

The External Documents tab displays the following fields and buttons:

- **Name** is the name of the external file. This field cannot be changed.
- **Length** is the number of bytes in the file. This field cannot be changed.
- **Modified Date** is the date the file was last modified or saved. This field cannot be changed.

- **Status** is the status of the document. When you initially add an external document, its status is New; when you save the sheet, its status is cleared. If you delete an external document, its status is set to Deleted until you save the sheet. If you load and modify the document from this tab, then its status is set to Modified.
- **Description** is a user-defined description. You can enter up to 4000 characters in this field.
- The **Attach** button ( ) allows you to attach an external document to the switching sheet. See **Adding an External Document** on page 11-79.
- The **Delete** button ( ) deletes the selected external documents from the switching sheet. See **Removing an External Document** on page 11-79.
- The **Open** button ( ) allows you to open the selected document. See **Opening and Editing an External Document** on page 11-80.
- The **Save As** button ( ) allows you to rename and save a selected document to the directory of your choice. See **Saving an External Document to Another Location** on page 11-80.

Adding an External Document

To add an external document to the active switching sheet:

1. Click the **External Documents** tab.
2. From the toolbar, click the **Add** button ( ).
3. From the **Attach Files** window, select the files you want to add to the sheet and click **Attach Files**. The External Documents tab displays the selected files in green. This indicates that the files have been selected, but have not yet been saved.
4. In the **Description** field, type a description of each file that will convey its contents and purpose.
5. Click the **Save Sheet** button to save the selected documents to the database. The documents are no longer displayed in green, indicating that the documents have been saved to the database, and their New status value is cleared.

Removing an External Document

To remove an external document from a switching sheet, do one of the following:

1. Click the **External Documents** tab.
2. Select the document in the table.
3. Click the **Delete** button ( ).

   Note: Alternatively, right-click the document and choose **Delete** from the context menu.

The status of the selected document is set to Deleted, and the file is displayed in red.

4. Click the **Save Sheet** button to save your changes. The document list is updated and the file is removed from the database.

   Note: The file is deleted from the database, but the local copy of the file on your PC is not removed.

Saving an External Document to Another Location

When you add a document to the external documents list, the system saves the document to the database. If you want to save a *copy* of the current version of the document on your PC, follow these steps:

1. From the **External Documents tab**, select the document and click the **Save As** button ( ) or right-click and select **Save As...**. The **Save File As** dialog box is displayed.
2. Browse to the directory where you wish to save the copy.
3. To change the file name, enter in a new name in the **File Name** field.

   Note: There is no rule against changing the file type. If you alter the file extension in the File Name field, then be aware that the file name will be saved exactly as you have typed it.
4. Click **Save**. A copy of the current database version of the document is saved to the directory with the specified name.

Saving a Selection of External Documents to Another Location

When you add a document to the external documents list, the system saves the document to the database. If you want to save a copy of more than one document at once to your PC, follow these steps:

1. From the External Documents tab, select multiple document entries and click the **Save Files to Directory...** button ( ) or right-click and select **Save Files to Directory...**. The Save Files To Directory dialog box is displayed.

   Note: The **Save Files to Directory...** button is only visible when more than one entry is selected in the External Documents list.
2. Browse to the directory where you wish to save the copy. Another option is to enter the directory path in the Directory text field.
3. Click **Save Files To Directory**. Copies of the current database versions of the documents are saved to the specified directory.

Opening and Editing an External Document

External Documents may be opened for inspection or to edit depending on the state of the switching plan. If the plan is in **View-Only** mode ( ), the document will be opened in read only mode; if the plan is in **Edit** mode ( ), the document will be opened with write permissions. See "Edit and View-Only Modes" on page 15.

Opening an External Document

To open an external document:

1. Click the **External Documents** tab.
2. Select the document you want to open and click the **Open** button (; or right-click the document and select **Open...**). The file is extracted to a local temporary directory and opened in the application associated with the file extension.

   Notes: If the file extension, or type, is unknown or the application is not available, a message will be displayed indicating that the application is unknown.

Editing an External Document

External Documents opened from a sheet in Edit mode are available to edit.

1. Make changes to the document as necessary.
2. Save and *close* the document; the database will be updated with the changes made in the extracted (temporary) document the next time the switching sheet is saved.

Troubleshooting Issues with External Documents

It is best to close the document after it has been edited and saved due to conflicts that can occur if the local file is saved outside of the control of Switching Management.

When the an external document is opened from a switching sheet, the application attempts to extract the external document to the temporary folder and compares the date stamp of its version to the local copy. If the file in the temp directory is newer than the database version, it gives a warning that changes to the local file will not be saved (because the plan was switched to View-Only mode). Once you click **OK**, the application will overwrite the local changes with the saved version of the external document in the database.

If the extracted document is still open when the application attempts to restore the saved version, a file lock conflict will result in another warning to inform you that the system cannot extract the database version of the document to the temporary folder. If this conflict occurs, you will be requested to take action to remove the conflict.

To remove the conflict, perform the following steps:

- On the warning dialog box, click **OK**.
- Close the external document.

Opening an Existing Switching Sheet

Depending on how a switching sheet is being worked, there are a number of ways for you to load an existing switching sheet.

Note: Web Switching is configured to limit you from having more than 15 switching sheets loaded at one time. Attempts to surpass the limit will result in an error.

- Open a Switching Sheet Window from Switching Sheet List
- From the Work Agenda
- From the Event Details
- From Crew Actions
- From the Control Tool

Note: If a step was highlighted when the sheet was closed, it will open with that step highlighted and centered in the steps list.

Open a Switching Sheet Window from Switching Sheet List

To open a switching sheet from the Switching Sheet List:

1. From the **File** menu, select **Switching Sheet...** from the **Open** option. The Switching Sheet List opens. Existing switching sheets are listed in the tabular view; the rows are color-coded to reflect switching sheet status:
    - **Green**: In Progress
    - **Red**: New
    - **Bright Yellow**: Scheduled, Checked, or Approved
    - **Pale Yellow**: Prepared
    - **Orange**: Requested
    - **Gray:** Completed or Rework
    - **White**: Hold/Pending
2. Select one or more sheets to open. To open multiple sheets, do one of the following:
    - Click, hold, and drag to select multiple adjacent rows.
    - Control-click to select multiple non-adjacent rows.
    - Use Dynamic Filtering to select sheets in the table and select all results by pressing **Control+A**.

    This window also supports standard filtering and sorting. The Switching Sheet List will be filtered based on your subscribed control zones. To determine the control zone that a sheet is associated with, the sheet's **Device**, as entered on switching sheet's **Request** tab, will be used. If no device has been entered, then the sheet will fall within the FUZZY zone.

    Notes:

    - For **Switching Request** users, the list will be filtered to display only Planned sheets. The Switching Request user is not limited to any particular control zone since they do not take authority over control zones.
    - The sheet will be loaded with the last highlighted step, if any were highlighted when the sheet was last closed, centered in the middle of the steps list.

Open Switching Sheet using Switching Sheet Search

To search for an existing Switching Sheet:

1. From the **File** menu, select **Switching Sheet Search...** from the **Open** option.
2. In the Search Switching Sheet dialog box, enter the desired text to search and press **Enter** or click the **Search** ( ) button.

Notes:

- For Product configuration only the switching sheet number and the sheet's Description field value will be used to match search criteria.
- The search results will be filtered based on the sheet's master device NCG and your subscribed zones of authority. The filtering of the results, based on NCG, will not apply to Administration and Switching Request user types.

From the Work Agenda

1. Select an event from one of the Events Lists that has a switching sheet associated to it. This can be determined by checking to see whether a switching sheet number is displayed within the Plan # column for the selected event.
2. Select the **Switching…** option from the **Tools** menu. The Open or Create New Switching Sheet dialog box is displayed.
3. Select the sheet you want to load from the Pre-Created Switching Sheets list and click **Open**. (You can start a new sheet by selecting a sheet type and clicking **Create**.)

From the Event Details

1. Select **Switching…** from the **Actions** menu. The Open or Create New Switching Sheet dialog box is displayed.
2. Select the sheet you want to load from the Pre-Created Switching Sheets list and click **Open**. (You can start a new sheet by selecting a sheet type and clicking **Create**.)

From Crew Actions

1. If a crew has been placed en route to a Master switching sheet event, then select the crew in the crew list.
2. Select **Switching…** from the Actions menu. If only one sheet is associated with the crew, it is displayed in the Web Switching Management window. If multiple sheets are associated with the crew, the Crew to Sheet Selection List displays all associated sheets. If no sheets are associated with the crew, an error message appears.
3. Select a sheet and click **Open**.

From the Control Tool

1. From a Viewer, double-click a device that is involved in a switching sheet to open the Control Tool.
2. Click the **Switching Plans…** button.
    - If the device is associated to one switching sheet (that is, it is listed in the **Device** field on the switching sheet's **Request** tab) **or** if it is included in one switching sheet step, that sheet will be opened in the Web Switching Management window.

- If the device is associated with multiple switching sheets **and/or** included in multiple switching sheet steps, the **Device to Sheet Operation List** window will open. Each associated sheet **and/or** operation will be listed in a separate row. Select a row and click **Open**.

Note: The Device to Sheet Operation List displays steps for active switching sheets and switching sheets that have been completed within the last 30 days. The switching sheet will be opened in the same mode that the Control Tool is in.

Copying a Switching Sheet

You can create a new switch plan that includes all of the steps in the open switching sheet by using the **Copy As** function. To copy an open switching sheet, do the following:

1. Select **Copy As...** from the Switching Sheet's **File** menu to open the **Copy Switching Sheet As** dialog box.
2. Select the new switching sheet's type:
   - **Planned**
   - **Emergency**
   - **Template**
   - **Outage Correction**
3. Click **Create a Copy** to create the new switching sheet.

   Note: The switching sheet type will determine how the new sheet opens (for example, recording on or off, which tab is visible, and so on).

Deleting a Switching Sheet

You can mark a switching sheet as deleted if it is no longer being used. Deleted sheets are retained by the system and can be loaded in View-Only mode when hard-associated to a canceled event. Web Switching Management does not support full deletions of switching sheets from the database. A record of all activity for a switching sheet is always retained in the database.

Note the following rules regarding deleted switching sheets:

- The **Delete** option is only available for planned, template, outage correction, and emergency sheets that do not contain any real-time instructed or completed steps or any event associations other than canceled and manual events.
- You cannot delete a switching sheet once it has been scheduled. If you need to delete the sheet, you must **Cancel** it first.
- You cannot delete an outage correction sheet that has an event association.
- Deleted sheets do not appear in the Device to Sheet Operation List. (This list is displayed from the Control Tool.)
- Safety documents associated with a deleted sheet do not appear in the Device to Safety Document List. (This list is displayed from the Control Tool.)
- The Impacted Customer lists and External Document lists are cleared for deleted sheets.

- Deleted sheets are ignored by the Model Verify functionality.

To delete a switching sheet, follow these steps:

1. Click the **Tracking/Audit** Log tab.
2. Enter the reasons for the deletion in the **Reason** field to the right of the grayed **Delete** button. (The **Delete** button is not enabled until you enter text in the Reason field.)
3. Click the **Delete** button.

Power Flow Analysis in Switching Management

Power Flow Analysis in Switching Management helps you predict the power flow in the network before and after execution of each step in the switching plan. This feature is available only for planned switching sheets when Power Flow is licensed.

Starting the Power Flow Analysis Tool

The Power Flow Analysis tool is a wizard that steps you through a series of options to gather input and provide results. To start the Power Flow Analysis wizard:

1. Open a Planned Switching sheet and record some steps.
2. With switching sheet in study mode and locked by current user, navigate to **Steps** tab. Select **Power Flow Analysis** and then the **Run…** option from the **Actions** menu.

Understanding the Power Flow Analysis Tool Window

The Power Flow Analysis tool is divided into three areas:

1. The Context pane (left): shows the steps in the wizard. Completed steps are shown in normal text, the current step is shown with bold text, and the remaining steps are grayed out.
2. The Main pane (right): provides the user options or results of wizard.
3. The Button pane (lower): contains the following buttons:
    - **< Back:** Moves the wizard back to the previous page.
    - **Next >:** Moves the wizard to the next page, as listed in the context pane on the left side of the window.
    - **Cancel:** cancels the power flow analysis. This button is shown while the power flow analysis is being run and the status on the wizard shows **Solving…**.
    - **Finish:** closes the Power Flow Analysis wizard.
    - **Help...:** Opens the online help system to the Power Flow Analysis in Switching Management tool help content

Selecting Options

Analysis Depth
All Steps: by default, all the steps in the plan are selected for power flow analysis.

Up to Selected Step: This option is enabled if a step is selected in the plan. You may choose this option if the power flow should run up to the selected step.

Constraints

- **Force kVA:** Power Flow Analysis tool user power flow engine for the analysis, by default. If at least one feeder is opted for kVA mode, then kVA engine is used for the analysis. If you want the tool to use kVA mode irrespective of the configuration, then you can force the tool to use kVA mode by checking the Force kVA check box.

- **Disconnect DG (IEEE-1547 rules)** will cause Power Flow Analysis to emulate DER disconnections during recent re-energization events. Therefore, in Restore scenarios, DER devices will be disconnected for the purpose of evaluating load.

Load Scenario

The Real-Time load scenario is selected by default for the analysis. You may choose a different scenario by selecting the **Modify** button and then selecting the appropriate option. You can choose a load scenario for a specific date and time or a custom option by selecting the various options for day, hour, temperature, and DER conditions.

Click **Next** to initiate the Power Flow Analysis and proceed to the wizard **Summary** page.

Analysis Summary

The **Summary** page displays a summary of power flow results generated by the Power Flow Analysis tool. The summary contains the following information.

- **# Steps:** is the number of switching steps in the plan.
- **Affected Feeders:** lists the feeders affected by the plan.
- **Affected Switches:** lists the switches affected by the plan.
- **Customers Impacted:** summarizes the number of regular and critical customers that are impacted by the plan. The counts are further divided into customers that are fully impacted and those that may be temporarily impacted by intermediate steps to allow non-load break operations.
- **Affected DERs:** summarizes the number of primary and secondary distributed energy resources (DERs) that are impacted by the plan. DERs, which can form island and act as source, are defined as primary.
- **Violations Before:** the number of violations before the plan is implemented.
- **Violations After:** the number of violations if the plan is implemented.

  Note: You may stop the power flow analysis on the switching sheet by clicking the Stop Solution button. The button is only available when the system is still processing the analysis.

To view detailed result data and steps for a plan, click **Plan Details...**, which will open the Power Flow Analysis Details window.

> **Note:** This is the same window that is displayed when **View Results…** menu is selected from the **Actions** menu's **Power Flow Analysis** option.

Power Flow Analysis Details

The Power Flow Analysis Details window provides information about the plan's switching steps and feeder status.

- **Switching Steps Tab:** The **Switching Steps** tab shows the individual switching steps and the effects of each switching step on the feeder where its load is being transferred. Associated violations are shown in the Switching Step Violation tree to the right. Associated switching step violations and affected DERs are shown to the right.
  - **Switching Step Violations:** Tree view is displayed with the total number of violations in feeders and type of each violation along with associated device.

    - **Affected DERs:** Tree view is displayed with the total number of affected DERs in feeders with type and its information.
- **Feeder Changes Tab:** The **Feeder Changes** tab shows the net effect of all switching changes on each of the affected feeders. This view clearly shows the net change in violations and affected DERs before and after all switching steps are performed.
- **Options Tab:** The **Options** tab shows the various parameters that were used to generate the power flow analysis related to analysis depth, constraints, and load scenario.

Click **Close** to return to the Summary page.

Click the **Navigation** button next to the Switching sheet name on the wizard or details window to navigate to the associated switching sheet.

Emergency Switching

Emergency Switching includes any unplanned switching operations that occur due to events during storms, equipment failures, or even planned switching actions that fail or are incorrect. Unlike planned switching where the switching sheet is created and studied before it is issued, in emergency switching the switching sheet is created as the operations take place in real-time. Essentially, a switching sheet is created and implemented simultaneously. Steps are recorded on the Steps tab as the Control Tool actions are being performed, and each step is considered complete as it is being recorded.

Emergency switching operates just like planned switching, except that the Web Switching Management window and Viewer must both be in real-time mode. Whenever switching steps are recorded in a switching sheet using the real-time Control Tool, the operation is considered emergency switching. The switching sheet provides a record of the switching operation.

This section includes the following topics:

- Creating an Emergency Switching Sheet
- Recording Emergency Operations

Creating an Emergency Switching Sheet

Emergency switching sheets are typically created from the Work Agenda, Create Event, or Event Details window. When you create an emergency sheet from either of these applications, the sheet is automatically associated to the event and saved to the database. The associated actions pertaining to the event, including the Open and Close step operations, will be included in the new sheet. The sheet cannot be deleted and will always remain associated to the originating event.

When an Emergency switching sheet is created that results in the sheet being associated to a device, then all device related attribute fields on the **Request** tab will be populated.

To create an emergency switching sheet, do one of the following:

- With an event selected in the Work Agenda, select **Switching...** from the **Tools** menu.
- From the Event Details Window, select **Switching...** from the **Actions** menu.
- From the Create Event window, select the Restored Real Outage event type and complete the required fields. Select the **Create Switching Sheet** check box and then click **OK**.

Open or Create New Switching Sheet

The **Open or Create New Switching Sheet** dialog box will open with the options of creating a new Emergency or Outage Correction switching sheet (from the Switching Sheet Types pane) or opening an existing switching sheet that is associated to the event from the Pre-Created Switching Sheets pane.

Create New Sheet

1. Select the Emergency sheet type from the Switching Sheet Types pane. The **Create** button is enabled.
2. Click the **Create button.**

3. The Web Switching Management window displays the new emergency sheet.

Open an Existing Sheet

1. Select an existing sheet from the Pre-Created Switching Sheets list. The **Open** button is enabled.
2. Click the **Open** button.
3. The Web Switching Management window will load the selected switching sheet.

Alternative Methods of Creating an Emergency Switching Sheet

- From a device's Control Tool, select **Switching Plans...** and then select **Create Emergency Switching Sheet...** to create a new switching sheet.
- From the **File** menu, select **New** and then select **Switching Sheet...** to display the New Switching Sheet window. Select **Emergency** as the sheet type and click **Create**.

  Note: An emergency switching sheet created this way will not be associated with an event.

Recording Emergency Operations

The new emergency sheet is automatically populated with Start and Finish dates. The Start date is the current date/time; the Finish date is defined as the Start date plus a predefined standard event duration.

Note: The duration is set to four hours in the product environment.

The sheet opens with the **Steps** tab active, real-time mode enabled, and recording on. If the Viewer is open, it transitions to real-time mode also. You can begin recording steps as described in the next section.

To record emergency switching operations, complete these steps:

1. Start a new emergency sheet as described in the previous section.
2. Create the steps by selecting devices in the Viewer window and selecting operations from the Control Tool. The process of adding recorded steps for emergency sheets is the same as for planned sheets in real-time mode. See **Adding Recorded Steps to a Switching Sheet** on page 11-42 for details.

   Once an action is completed in the Control Tool, the following occurs:

   - The status of the recorded step is set to Completed.
   - The **Executed By** field is populated with your user ID.
   - The **Completed Date** field is populated with the date and time shown on the Control Tool or the current time if a Control Tool date/time value is not specified.
   - Instructed actions use the date/time specified from the Control Tool to populate the Instructed Date field. If no Control Tool date/time value is specified, then the current time is used to populate the Instructed Date field.
   - Any outages created by completing steps in Real Time that are associated to an Emergency switching sheet will be classified as Real Outages and not Planned Outages. These Real Time step completions can occur from the Control Tool or from Web Switching Management.

3. When you have completed all emergency steps, click the **Tracking/Audit Log** tab and set the sheet state to *Completed* by clicking the **Complete** button. The **Confirm State Transition** dialog box will open; click **Yes** to confirm the completion or click **No** to close the dialog box without completing the sheet. The Finish Date may be updated, if necessary.

    - *Optional*: Add a comment in the text field to the right of the **Complete** button.

    Note: Changes can no longer be made to the switching sheet while it is in the Completed state.

Understanding the Switching Sheet List

The Switching Sheet List is a tool used to manage active switching sheets and any switching sheet completed in the last 30 days. To load switching sheets older than 30 days, use the Search Switching Sheet window. The Switching Sheet List will load the full list when it is first displayed. After the initial load of data, the list will dynamically update with changes from all the users on the system. Dynamic updates happen periodically at 15 second intervals. A switching sheet's updates will only be broadcast out to the other users once it has been saved to the database.

The full list of switching sheets will be queried from the database when you alter your subscribed zones via the Authority tool. The full list will also be queried if you select the **Refresh** button from the **Actions** menu. Once the full list has been loaded, the list will go back to being dynamically updated.

The Switching Sheet List serves as the primary mechanism for loading switching sheets. You can either double click a single entry or highlight multiple entries and click the **Open...** ( ) toolbar option. A right-click **Open...** menu option is also available. When loading multiple switching sheets, a progress bar will be displayed at the bottom of the window. Once an open request has been initiated, it cannot be canceled, but the system does restrict you from having more than 15 switching sheets open at any one time.

Menu and Toolbar Features

This section lists and describes the menu options and toolbar icons available in the Switching Sheet List.

File Menu

The table below describes the options available on the File menu.

Menu Option	Description	Toolbar Icon
New...	Opens the New Switching Sheet tool that allows you to create a new switching sheet based on the switching type (for example, planned or emergency).	
Open...	Opens the selected switching sheets. If the window is not pinned or docked, the window will be closed once the sheets are loaded. **Note:** If the sheet is locked by another user, the Failed to Establish User Lock dialog box will be displayed; see **Opening Locked Documents** on page 11-97 for information.	
Copy Steps	Copies the selected switching sheet's steps without opening it. The copied steps may then be pasted into another switching sheet.	
Export Table...	Opens a dialog box to allow you to save the current table view data to a comma separated value (csv) file.	

Menu Option	Description	Toolbar Icon
Export Sheets...	Export the selected switching sheet as JavaScript Object Notation (JSON) text files to your local file system. These files can then be imported into NMS. This option is restricted to Administration and Trainer user types.See **Exporting/ Importing Switching Sheets** on page 11-100 for details.	--
Import Sheets...	Import switching sheets into NMS via JavaScript Object Notation (JSON) text files from your local file system. These JSON files were created from the **Export Sheets...** option or from the switching sheet's **Export** option. Imports are restricted to switching sheet types Planned, Emergency, Template and Training Scenario.See **Exporting/Importing Switching Sheets** on page 11-100 for details.	--
Print List...	Displays the Print Preview dialog box so you can view or print the list.	
Print Preview Selected Sheets...	Displays the Content Selection dialog box so that you can choose which sections of each highlighted sheet to include in the generated documents. By default, PDF documents will be created for each of the highlighted switching sheets.	
Print Selected Sheets...	Displays the Content Selection dialog box so that you can choose which sections of each highlighted sheet to include in the generated documents. By default, PDF generated documents will be printed for each of the highlighted switching sheets. The Content Selection dialog box also includes the target print service. Your default printer will be the default option selected in the combo box list.	
Email Selected Sheets...	Displays the Content Selection dialog box so that you can choose which sections of each highlighted sheet to include in the generated documents. By default, PDF documents will be created for each of the highlighted switching sheets.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the Switching List window.	--

Sort Menu

The table below describes the options available on the **Sort** menu.

Menu Option	Description	Toolbar Icon
Sort Dialog...	Opens the Sort Dialog, allowing you to create, modify, apply, and save user-defined sorts. See **Using the Sort Dialog Box** on page 1-9.	--
Sheet #	Applies the default sort, which is the sheet # in descending order.	--

Note: The Today and Tomorrow Switching Sheets List filters are based on the Start and Finish dates of the switching sheets. If tomorrow's or today's date falls within that time period, then the sheet will be included in the list. If the sheet has a Start date that is before today's date and has no Finish date, then the sheet will be included in the list.

Actions Menu

The table below describes the options available on the **Actions** menu.

Menu Option	Description	Toolbar Icon
Refresh	Refresh the switching sheet list with the latest data from the database.	
Unpin	Unpin the window so that it will close after an open safety document request. **Note:** The icon shows the current state so the option will be the result of the action and the button will initially show the current state: to unpin, click the **Pin** button.	
Pin	Pin the window so that it will not close after an open safety document request. **Note:** The icon shows the current state so the option will be the result of the action and the button will initially show the current state: to pin, click the **unpinned** button.	

Help Menu

The table below describes the options available on the **Help** menu.

Menu Option	Description	Toolbar Icon
Switching Sheet List Help	Opens the online help system to the Switching Sheet List help content.	--

Switching Sheet List Data Fields

The Switching Sheet List provides a tabular view of the switching sheets.

- The **Status** column displays the status of the switching sheet. See **Switching Sheet States** on page 11-25 for a complete list of switching sheet states.
- The **Type** column displays the switching sheet's type.
- The **Sheet #** column displays the switching sheet's number.
- The **Nominal Feeder**, **Current Feeder**, **Device**, **Nominal Substation**, **Nominal Substation**, **Description**, **Owner**, **Charge Number**, **Start Date**, **Finish Date** columns display the values from the sheet's **Request** tab.
- The **#Steps** column displays the number of steps in the switching sheet.

- The **User** column displays the user that created the switching sheet.
- The **Owner** column displays the current owner of the switching sheet as shown in the Owner field of the switching sheet's **Request** tab.
- The **Charge Number** column displays the Charge Number as shown in the first Charge Number field of the switching sheet on the sheet's **Request** tab.
- The **Start** and **Finish** Date fields display the switching sheet's Start and Finish Date values as shown on the switching sheet's **Request** tab.
- The **Completed Date** is the date the switching sheet was completed.
- The **Verify** column displays Yes when the switching sheet involved any model changes and require verification.

Understanding the Switching Switch List Filter Pane

The Switching Sheet List provides the following Global filters.

Global Filter	Description
Active	Displays all the active switching sheets (switching sheets NOT in the Status New, Completed, Deleted, Canceled, or Training-Completed).
All	Displays all non-complete switching sheets and completed switching sheets from the last 30 days. - No Icon Completed - Displays switching sheets that have been completed in the last 30 days.
Completed	Displays switching sheets that have been completed in the last 30 days.
In Progress	Displays all switching sheets in the In Progress state.
My Sheets	This displays all sheets that were created or are owned by the current user.
New	Displays all switching sheets in the New state.
Require Verification	Displays the switching sheets that require verification after model change.
Today	Display switching sheets that are scheduled or are being worked on Today.
Tomorrow	Display switching sheets that are scheduled for Tomorrow.

Opening Locked Documents

The Failed to Establish User Lock dialog box appears when opening switching sheets or safety documents locked by another user. The Previously Established Lock List pane displays the details of the locked sheet or safety document:

- **Fields**
  - **Object Type:** the sheet/safety document type; for example, a planned switching sheet or a HOLD safety document.
  - **Object #:** the number of the sheet/safety document.
  - **User:** the user who has the sheet/safety document locked.
  - **Date:** the date when the sheet/safety document was locked.
- **Buttons**
  - **OK:** closes the dialog box.
  - **Steal Locks...:** opens the Steal Locks dialog box, which allows you to steal the lock to enable editing the sheet or safety document.

Click **OK** to dismiss the dialog box or select one or more rows and click **Steal Locks...** to take the locks from the current owner.

Stealing Locks

When you click the **Steal Locks...** button on the Failed to Establish Locks dialog box, the Steal Locks confirmation dialog box appears. Enter a reason for stealing the lock and click **OK** to take ownership of the selected objects from the current user. The user who had the lock will then be presented with a Stolen Object Locks dialog box that lists the object type, object number, user who stole the lock, and the date when the lock was stolen.

Notes:

- If you attempt to steal locks on a sheet controlled by the system, you will get a Steal Locks Exemption dialog box and will not receive control of the sheet. Click **OK** to dismiss the dialog box.
- These actions are also added to the Audit Log of the sheet or safety document.

Event Associations

Event associations are used to associate events to switching sheets. Associated events are displayed in the Events List on the Steps tab header. (See **Events List** on page 11-38.)

Events can be associated to switching sheets in two ways:

- Hard Associations are automatic associations that are normally made as you perform actions within Web Switching Management or perform actions from the Control Tool that are recorded into the switching sheet. An event can only have one hard association to a switching sheet. Hard associations cannot be broken once the association has been established; however, the association can be moved to a new switching sheet if the steps that created the event are moved.
- **Soft Associations** are associations that are normally added manually from the Events List in Web Switching Management. An event can be softly associated to an unlimited number of switching sheets. This type of association can be manually removed up until the associated switching sheet has reached the Completed state.

  Note: Event associations do not occur when the event causing action is recorded into the Miscellaneous Log.

Hard Associations

Hard associations can also be further classified by type. There are four types of hard association relation types:

- **Master** is the relationship type made between a Planned switching sheet and its active master switching event. There can only be one Master Event associated to any single switching sheet.
- **Canceled** is the relationship type made between a Planned switching sheet and a canceled master switching event. There can be any number of Canceled event

associations to a single switching sheet. These Canceled events were originally classified as Master Events for the plan.

- **Planned** is the relationship type made between a Planned switching sheet and a planned outage. A planned outage is an outage that was generated from a planned switching sheet after the completion of an action recorded in the Steps section of the plan.
- **Forced** is the relationship type made between an Emergency switching sheet and an unplanned outage or non-outage event. A Forced relationship will be made when recording real-time actions into an Emergency switching sheet. The relationship can also be made when creating an Emergency plan for an event from the Work Agenda Events List or the event's Event Details display.

Soft Associations

Soft associations only have one classification type:

- **Manual** is the relationship type made between a switching sheet and a manually associated event. Manual associations are also made between plans if an outage is hard associated to one plan and the outage is restored with another switching sheet. The plan that recorded the restoration step will have the event automatically associated to it with a classification type of Manual. Grouped events can also cause switching sheets to be manually associated. Partially restoring an outage or adding customers to an outage will create a manual association between the switching sheet and the event, if no association (hard or soft) already exists.

Rules for Grouping Event Associations

When resolving outages in the network, it is common for events to be grouped together. When events are grouped, the associations will adhere to the following set of rules:

- If an event with no hard association consumes another event with no hard association, then the resulting event will have no hard association, and its manual associations will be a combined list of both events' manual associations.
- If an event with a hard association consumes an event with no hard association, then the resulting event will have the surviving event's hard association and a combined list of both events' manual associations.
- If an event with no hard association consumes an event with a hard association, then the resulting event will have the consumed event's hard association and a combined list of both events' manual associations.
- If an event with a hard association consumes another event with a hard association, then the resulting event will have the surviving event's hard association. The consumed event's hard association will be listed as a manual association along with the combined list of both events' manual associations.
- If an event consumes another event with an association to the same switching sheet, then the above rules will apply, but the plan will only be listed once in the event's association list. An event can only have one association to a specific switching sheet.

Exporting/Importing Switching Sheets

Switching sheets can be exported to your local file system. Exported switching sheets are written in JavaScript Object Notation (JSON). All of the data from the sheet is included in the JSON file, which can be opened in any application capable of reading a JSON.

Exported switching sheet JSON files can be imported by **Administration** and **Trainer** user types who can use them to populate NMS training or test environments. When importing switching sheets, unique handles for devices, steps and sheets are looked up on the new system or are reset; in other words, you may not have the same sheet number on the import environment as was displayed on the export environment since multiple sheets cannot have the same switching sheet number. This is also true if you export and import on the same environment. Switching sheet, safety document, and step states will all be set back to their initial state when those objects are imported. NMS does not support the option to import state data from a partially or fully executed switching sheet.

The Import Files dialog box is limited to only showing files with the `json` file extension. You are given the option of selecting individual files or a parent directory. If a directory is selected, then only the files in that directory will be included in the import (in other words, the function will not look for any files found in any sub-directories).

As part of the import mechanism, the original sheet's external documents, impacted customers, events, crews, and audit log will be ignored. This data cannot be imported, but can be found in the exported JSON file. Your project can also configure which additional data elements should be ignored when importing switching sheets. The import also assumes your project's configuration is synchronized between the systems where the sheets will be exported or imported. If you export a switching sheet and later add or remove data fields to a switching sheet, those data fields will not be populated during the import. You will be required to manually edit the JSON data file or export a new file with the matching data fields if that data is needed during an import.

When exporting or importing multiple switching sheets as part of one request, you will be restricted to 100 switching sheets at a time. When the request is being carried out from the **Switching Sheet List**, a progress bar will be displayed at the bottom of the list. You will not be able to cancel this operation unless a conflict occurs with one of the switching sheets and you are presented with a dialog box that includes a **Cancel** button. The feature is also limited to one user at a time; in other words, multiple users on the system cannot export/import switching sheets at the same time. You will need to wait for the current operation to finish before initiating a new request. An error dialog box will be displayed if an import/export is already in progress.

Crew Assignments

Normally when working a switching sheet, the crews are automatically associated to the sheet when the event the crew is assigned to is associated to the sheet. These crews show up in the Crews list just above the steps on the Steps tab. When crews need to be added to the list that will not be assigned or cannot be assigned to events, then the Select Crew dialog box must be used. The Select Crew dialog box is initiated from the Crews list **Select Crews...** toolbar button ( ). The dialog box has two tabs for selecting the type of crew you wish to associate to the switching sheet.

System Crews

System crews are the same crews that are available to you from the Crew Actions list. Only available crews will show up in this list. The System Crews list shows the crew's ID, Type, Contact, Shift Status and Job Status. Table column filter fields are available to filter the list down to a specific crew entry. Once an entry is found, the **OK** or **Apply** buttons can be used to assign crews to the switching sheet. Selecting the **OK** button will assign the crews and close the Select Crew dialog box. The Cancel button will cancel any existing selections and close the Select Crew dialog box.

Contractors

The Contractors tab gives you the capability to create contractor crews on the fly. Contractors are crews that are not system crews and do not exist in the NMS proper crew list. The crews available from the Contractor Crew List are only available for selection from Web Switching sheets and Web Safety documents. These crews will not be generally available throughout the NMS environment.

Working with Safety Documents

Oracle Utilities Network Management System Safety Documents, which are an electronic representation of paper safety documents used for switching operations, provide information about a particular operation and record the issuance and release of tags on devices. For switching operations, safety tags are first physically placed on devices, and then the safety document is issued; note that the safety tag must match the safety document type (for example, Hold tags are used with Hold safety documents). Issuing the safety document effectively gives the crew permission to begin work. When the work is completed, the safety document is released, warning the crew that they must stay clear. Once the safety document is released, safety tags may be removed from the devices and the switches may then be closed.

This section includes the following topics:

- Understanding Safety Document Types
- Mapping Step Types to Safety Document Types
- Using Safety Documents in Switching Plans
- Opening Existing Safety Documents
- Completing Safety Documents
- Aborting Safety Documents

Understanding Safety Document Types

Oracle Utilities Network Management System Web Switching Management includes a group of safety documents that represent common utility safety document types. These standard forms may be used to represent established safety documents in your organization.

- **Clearance** - indicates that clearance for work on a device or in an area has been obtained from the proper authority. The proper authority might be a control center supervisor or a regional dispatcher. Clearance documents imply that the devices or area that requires work has been made safe to work on or in.
- **Delegated Control** - safety document (DCZ) allows users to identify a section of the network that has been turned over to the field for operation. The operator is no longer in control of the section of the network. It is the responsibility of the crew to operate in a safe and secure manner and document actions taken. See **Delegating Control of a Network Area** on page 11-118 for more information.
- **Hold** - indicates that the tagged devices should not be operated (for example, if the devices is open, it should remain open). Hold safety documents are used when the device is to be held open or closed in order to complete work in an area of the distribution system. The purpose of the Hold safety document is to protect crew members and prevent injury to human life. Hold safety documents are placed and removed by individuals who have authority over a specific area or operation and serve to restrict the operation of a device.
- **Hot** - indicates that hot line work is being performed (for example, live wires), and if tagged devices are opened, they should not be closed until the safety document is released. When Hot Line safety documents are present, device operations in the area should be performed with caution.

- **Information Note** - provides some pertinent information about the devices. Information Note safety documents are for informational purposes only. These safety documents do not restrict operation of the device, but provide information that a crew member or utility employee should be aware of when working on the devices.
- **Warning Tag** - provides warning information about the tagged devices. Like Information Note safety documents, Warning Tags are for informational purposes only. These safety documents do not restrict operation of the devices, but provide information that a crew member or utility employee should be aware of when working on the tagged devices.

While safety document names and features may vary, understanding these types will help you understand the general use of most safety documents. Crews typically "own" safety documents and must authorize their release when they are finished working in an area or on a device.

Mapping Step Types to Safety Document Types

Safety document types are associated with certain types of steps. These step-to-safety document mappings are configurable. The following list shows what types of steps each safety document type is pre-configured to accept.

- **Clearance**:
  - Place Clearance Tag
  - Remove Clearance Tag
  - Place Ground
  - Remove Ground
- **Delegated Control (DCZ)**
  - Place DCZ Tag
  - Remove DCZ Tag
- **Hold**:
  - Place Hold Tag
  - Remove Hold Tag
  - Place Ground
  - Remove Ground
- **Hot**:
  - Place HOT Tag
  - Remove HOT Tag
  - Place Ground
  - Remove Ground
- **Informational Note**:
  - Place INFO Tag
  - Remove INFO Tag
- **Warning Tag**:

- Place WARN Tag
- Remove WARN Tag

Using Safety Documents in Switching Plans

Understanding the Safety Documents Tab

The Switching Sheet Safety Documents tab displays a list of all safety documents associated with a switching sheet. The Safety Documents tab displays the following fields and menu bar buttons:

Fields

- **Type** displays the type of safety document. (See **Understanding Safety Document Types** on page 11-102.)
- **Doc #** displays the safety document number.
- **Status** displays the status of the safety document. Valid statuses are: New, Issued, Released, Unissued, Aborted, Deleted, and Completed.
- **Crews** displays the crews assigned to this safety document.
- **Description** displays a description of the safety document.

Menu Bar Buttons

- The **Refresh** button( ) refreshes the safety document list.
- The **Create a Safety Document** button ( ) opens an context menu that allows you to choose a safety document type or open the Select Safety Type dialog box.
- The **Open** button ( ) opens the selected safety document. (Alternatively, you can double-click the document in the list.)
- The **Associate** button ( ) displays the Switching Sheet Association dialog box. From the dialog box you can associate the safety document to a different switching sheet. See **Switching Sheet Associations** on page 11-123 for more details.
- The **Disassociate** button ( ), when pressed, displays a confirmation dialog box pertaining to the disassociation of the safety document. Confirming the action will cause the safety document to be disassociated from the switching sheet. Once disassociated, the document is converted into a stand alone safety document.
- The **Delete** button ( ) deletes the selected safety document. Safety documents can only be deleted if there are no steps associated to the document. Deleted safety documents are not removed from the database.

Safety Document Dialog Overview

The Safety Documents associated to switching sheets are displayed as detached windows. When working with Web Safety, when there is no originating switching sheet, the document takes on a slightly different behavior and look. For more information on Stand Alone Safety Documents see **Web Safety** on page 11-129.

Toolbar Icons

- The **Save** button ( ) saves your changes to the safety document.
- The **Print Preview** button ( ) allows you to select a report format and then preview the safety document in the selected format.
- The **Print** button ( ) allows you to select a printer and then print a hard copy of the safety document to the selected printer.
- The **Email** button ( ) allows you to email a version of safety document. You will be prompted to select a report format (PDF, HTML, RTF, or XML); click **Email...** to generate the file, which will be attached to a new message launched from your default email application.
- The **Validate** button ( ), which is available on the DCZ safety documents, is used to determine whether the listed devices potentially isolate an area of the network. If the list of devices is not sufficient, a dialog will suggest the first missing device needed, provide an option to add it, and re-validate the new list.
- The **Issue** button ( ) adds a step for issuing the selected safety document. The step is added to the end of the steps list or after the step insertion indicator (if one has been placed). This button is enabled when a document is in the New and Released states so the document may be issued and released multiple times. If any of the devices in the Tag Points list are not associated to steps, then the appropriate conditions will be placed on those devices when the document is transitioned to the Issued state.
- The **Unissue** button ( ) is used to place an Issued safety document or a Released safety document into an Unissued (edit) state where the device lists can be altered. While in the Unissued state, you can add devices to the lists and mark devices already in the list for removal. Only when the safety document transitions back to the Issued state will the changes be applied.
- The **Release** button ( ) adds a step for releasing the selected safety document. The step is added to the end of the steps list or after the step insertion indicator (if one has been placed). This button is only enabled if the safety document has been issued. Selecting this button will cause the Complete button to be enabled.
- The **Complete** button ( ) adds a step for completing the selected safety document. The step is added to the end of the steps list or after the step insertion indicator (if one has been placed). If any of the devices in the Tag Points list are not associated to steps, then the appropriate conditions will be removed from those devices when the document is transitioned to the Completed state.
- The **Abort** button ( ) allows you to set the status of the safety document to Aborted. The system prompts you to confirm the action before aborting. This button is only available in real-time mode and only for safety documents that are in the New state.

- The **Associate** button ( ) displays the Switching Sheet Association dialog box. From the dialog box you can associate the safety document to a different switching sheet. See **Switching Sheet Associations** on page 11-123 for more details.
- The **Disassociate** button ( ), when pressed, displays a confirmation dialog box pertaining to the disassociation of the safety document. Confirming the action will cause the safety document to be disassociated from the switching sheet. Once disassociated, the document is converted into a stand alone safety document.

Safety Document Panes

The safety document dialog box displays the following panes:

- **Tag Points** display the devices that the safety document is associated with.

Table Columns

- **Edit State (untitled):** an iconic representation of the edited state of the device in the Unissued state. The edits will be applied when the document is issued. When working in Study mode, the edit state indicators will remain visible until the document is issued in real time.
  - **:** The device has been marked for removal.
  - **:** The device has been added to the device list and will be used as a boundary point the next time the document is issued.
- **Device:** the device used to define the area or point of coverage of the safety document.
- **Phases:** the device phases affected.

Toolbar Buttons

- Record / Stop: Toggles recording of devices off or on. The Tag Points list allows users to record devices via selections from the Viewer. To enable this feature, simply turn on recording and select devices in the Viewer.
- The **Add Device...** button ( ) allows you to manually add a device to the list.
- The **Undo Device Edit** button ( ) allows you to undo an addition or removal of a device from the list. This option is only available when making device modifications in the Unissued state.
- The **Remove Device** button ( ) allows you to remove a selected device from the Tag Points device list.
- The **Change Phases** button ( ) brings up the Select Phases dialog box. From the dialog box, new phases for the device can be selected.

Select Phases Dialog Box

The Select Phases dialog box allows you to alter the phases for the highlighted device in one of the safety document's devices list. When the document is in the Unissued state, a new pending entry will be added to the devices list with the new

phase selections. When the document transitions from Unissued to Issued in Real Time, the new phase changes will be activated.

- The **Object Focus** button ( ) focuses the Viewer 1 window on the selected device.

- **Grounds** displays the devices that the safety document will protect and validate the grounds on.
  - **Table Columns**
    - **Edit State (untitled):** an iconic representation of the edited state of the device in the Unissued state. The edits will be applied when the document is issued. When working in Study mode, the edit state indicators will remain visible until the document is issued in real time.
      - : The device has been marked for removal.
      - : The device has been added to the device list and will require a ground condition the next time the document is issued.
    - **Device:** the device that should be protected with a ground before the document can be issued.
    - **Phases:** the device phases to be checked.
  - **Toolbar Buttons**
    - Record / Stop: Toggles recording of devices off or on. Grounds list allows users to record devices via selections from the viewer. To enable this feature, simply turn on recording and select devices in the Viewer.
    - The **Add Device...** button ( ) allows you to manually add a device to the list.
    - The **Undo Device Edit** button ( ) allows you to undo an addition or removal of a device from the list. This option is only available when making device modifications in the Unissued state.
    - The **Remove Device** button ( ) allows you to remove a selected device from the Grounds device list.
    - The **Change Phases** button ( ) brings up a Select Phases dialog box. From the dialog box, new phases for the device can be selected. See Select Phases Dialog Box for details.
    - The **Object Focus** button ( ) focuses the Viewer 1 window on the selected device.
- **Other Devices** is a text field that allows you to enter a list of non-modeled devices.

  Note: An entry is required in at least one of these fields: Grounds, Tag Points, or the Other Devices.
- **Nominal Feeder** displays the feeders for the devices listed in the **Tag Points** and/or **Grounds** devices list.

- The **Update** button ( ) is used to populate the **Nominal Feeders** field with the list of **Feeders** associated to the linked switching sheet step devices and the devices listed on the safety document.
- The **Reset Feeder Value** button ( ) is used to replace the safety document's current feeders value with the associated switching sheet **Nominal Feeders** field value when the safety document was created. The switching sheet's **Nominal Feeders** field is found on the **Request** tab.

- **Nominal Substation** displays the nominal substations for the devices listed in the **Tag Points** and/or **Grounds** list. To alter this value, enter your new value into the field.
  - The **Update** button ( ) is used to populate the **Nominal Substation** field with the list of substations associated to the linked switching sheet step devices and the devices listed on the safety document.
  - The **Reset Substation Value** button ( ) is used to replace the safety document's current substation value with the associated switching sheet **Nominal Substation** field value. The switching sheet's **Nominal Substation** field is found on the **Request** tab.
- **Current Feeder** displays the current feeders for the devices listed in the **Tag Points** and/or **Grounds** list. This value is read-only and will dynamically update as long as the safety document is loaded.
- **Current Substation** displays the current substations for the devices listed in the **Tag Points** and/or **Grounds** list. This value is read-only and will dynamically update as long as the safety document is loaded.

  Note. See **Device Associations with Nominal and Current Network Components** on page 11-2 for information.
- **Assigned Crews** displays a table list of the Crew IDs of the crews that the safety document has been issued to, as well as each crew's mobile number, mobile carrier, alternate number, alternate number type, pager number, and crew type. The crew IDs are auto-populated with the value from the **Instructed To** field in the safety state transition switching step. A crew is required in this list before an Issue safety state transition step can be completed in real-time.
  - To select a crew to assign to this safety document, click the **Select Crew...** ( ) button to open the Select Safety Crew dialog box. See **Assigning Crews to a Safety Document** on page 11-110.
  - To display the selected crew information, click the **Crew Info...** ( ) button.
  - To indicate whether the crew is issued or clear of the zone defined by the safety document, click the **Crew Issued/Clear** ( ) button and select either **Issued** or **Clear**. The Position column will be updated with the status.
  - To delete crews from this list, click the crews and then click the **Remove Crew**s button ( ). At least one crew must remain assigned while the document is in the Issued state.
- **Description** is a text field that allows you to enter notes for the safety document.
- **Audit Log** contains the following information:

- **Table Fields:**
  - **Date**: the date and time of each entry.
  - **Description:** a description of the state change or device operation.
  - **Device:** the device associated with the step.
  - **User:** the name of the user who recorded the action.
  - **Phases:** the phases affected.
  - **Crews**: the crew identifiers pertaining to the audit log entry.
- The **Comment** section of the Audit Log pane allows you to add a comment to the log.

- **Edit Log** tracks the changes made to the entry fields of the document. It contains the following information:
  - **Date:** the date and time of each entry.
  - **User:** the name of the user who recorded the action.
  - **State:** the state of the safety document when the entry was added.
  - **Field:** The name of the field that was updated.
  - **Previous Value:** The previous value of the field before the update.

Creating a Safety Document from a Switching Sheet

Devices may be added automatically to a Safety Document by creating a safety document from step selections within the Steps list of the originating switching sheet. You may create a safety document in two ways:

1. **Create a Safety Document for a Selected Step:**
   - On the Steps tab, select the steps to which you want the safety document associated. For instance, select Hold Tag steps and Grounding steps to create Hold safety documents. These steps then define the isolation and grounding points for the safety document.
   - Click the **Create Safety Document for Selected Step** toolbar button ( ).
     - If the selected step maps to multiple types of safety documents, the Select Safety Type dialog box prompts you to select the document type. For example, if you select only Grounding steps, then the Select Safety Type Dialog allows you to choose Clearance, Hold, or Hot as the safety document type.

     Your selected step must conform or map to at least one safety document type. If a selected step does not map to a safety document type, the system will return an error message in the Invalid Step Selection dialog box. Click **OK** to close the dialog box.
     - Select the safety document type and click **OK**.

   Note: For a list of step types to safety document types, see **Mapping Step Types to Safety Document Types** on page 11-103. The steps in the sheet will also be updated with an additional entry in the Operation text indicating which safety document the step is associated to.
2. **Create a Safety Document Without Selecting a Step:**

- To create a safety document without selecting a step, click the **Create Safety Document** ( ) button, which provides an context menu allowing you to select a specific safety document type or open the Select Safety Document Type dialog box.
  - If you select a safety document type, the new safety document will be created. If you select **Select Safety Type Dialog...**, the Select Safety Type dialog box will open allowing you to choose the document type. Select the safety document type, and click **OK**.

Assigning Crews to a Safety Document

The Select Safety Crew dialog box allows you to assign crews to the safety document. You may also create contractor crews from the **Contractors** tab. By default, the dialog box will open showing the crews listed on the parent switching sheet's Crews list. The **Switching Sheet Crews** tab will only be visible for safety documents associated to switching sheets.

Populating Crews from the Switching Sheet

Crews are automatically assigned to safety documents when the safety document is created from a switching sheet where the switching sheet has crews listed in the **Crews** list. If a subset of the switching sheet's crews should be used to populate the safety document's Crews list, then simply select the crews prior to creating the safety document from the switching sheet.

1. Add a list of crews to the switching sheet's **Crews** list.
2. Click the switching sheet's **Create Safety Document** button and select the desired safety document type.

   The safety document will be created with a list of assigned crews matching the crews listed in the parent switching sheet. If **none** or **all** of the crews were highlighted in the switching sheet, then all of these crews will be assigned to the safety document. If a subset of the crews were highlighted in the switching sheet, then only those crews will be assigned to the safety document when it is created.

Selecting Crews from the System Crews List

To assign a standard (system) crew to the safety document:

1. Click the **Select Crew...** button ( ) to open the Select Safety Crew dialog box
2. On the **System Crews** tab, select one or more crew rows in the table.

   Note: You may **Shift+Click** to select multiple adjacent rows or **Control+Click** to select non-adjacent rows.
3. Click **OK** to assign the crews and close the dialog box.

   Note: Click **Apply** to assign the selected crews without closing the dialog box. Crews will appear in the "Unknown" position.

Creating and Assigning Contractor Crews from the Contractor Entry Form

You may add a new contractor crew using the Contractor Entry Form. The created crews are assigned to the current safety document and added to the Contractor Crew List from which they may be assigned to other safety documents or switching sheets.

The form contains the following fields:

- **Crew ID:** the crew name or identifier.
- **Contact:** the name of the crew contact person.
- **Mobile #:** the crew's mobile number.
- **Mobile Carrier:** the wireless company providing service to the mobile phone or radio.
- **Alternate #:** an alternate number for the crew.
- **Alternate Type:** the crew's alternate number type (for example, home, personal mobile, and so on).
- **Pager #:** the crew's pager number.
- **Type:** crew option menu that allows you to choose the crew type.
- **Comments:** text field for comments.

Actions

- **Create and Assign Crew** ( )**:** assigns the new crew entry to the safety document and adds them to the contractor crew list.

  Note: The Select Safety Crew dialog box closes once the add button ( ) is clicked.

- **Clear Crew Fields** ( )**:** clears the entry form.

Using the Contractor Crew List

The Contractor Crew List allows you to assign existing contractor crews to the safety document or populate the Contractor Entry Form to reuse crew data when creating additional contractor crews.

The form contains the following toolbar buttons:

- **Refresh Crew List** ( )**:** refreshes the contractor crew list with the full list of active contractors found in the database.
- **Assign Crew** ()**:** assigns crews to the safety document.
- **Transfer Crew Data** ( )**:** transfers the selected crew's data up to the Contractor Entry Form fields. This allows contractors to be copied with minimal effort.
- **Obsolete Crew** ( )**:** obsoletes a crew so that it no longer shows up in the Contractor Crew List. If the crew is still part of an active safety document or switching sheet, an error will be generated. The crew is not deleted from the system as it is still needed for auditing purposes in completed switching sheets and safety documents.

Assigning an Existing Contractor Crew

1. Select the crew rows in the Contractor Crew List.
2. Click the **Assign Crew** button ( ) to assign the crews to the sheet.

Assigning a New Contractor Crew Using Existing Crew Data
To create an additional contractor crew using data from an existing crew, do the following

1. In the Contractor Crew List, select the row with the desired crew data.
2. Click the **Transfer Crew Data** button ( ) to copy the data to the Contractor Entry Form.
3. Edit the data for the new crew.
4. Click the **Create and Assign Crew** button ( ) to assign the new crew to the safety document and add them to the Contractor Crew List.

Adding a Safety State Transition Step

Each safety state transition step performs a single action, such as issuing or releasing a safety document. To add safety state transition steps, do the following:

1. From a switching, create a new safety document. See **Creating a Safety Document from a Switching Sheet** on page 11-109 for more information.
2. Validate that step recording is still turned on in the Steps tab.
3. Click the **Issue** button ( ) on the safety document. A new safety state transition step is recorded into the switching sheet steps list. The Operation column of the step indicates the type of operation being performed.

   Notes:

   Conditions associated to the devices in the Tag Points and Grounds lists have to be on the devices for the document to be issued. If the conditions are not on the devices, an error dialog box will be displayed with the list of conditions that could not be found. The switching steps associated to those conditions will be highlighted in the switching sheet. This is mode specific, so when in study mode, the conditions have to be on the devices in your study session. Conditions are not required when only the Other Devices field is filled out.

   When recording the safety state transition steps in Real-Time, the safety document must have an assigned crew before it can be issued. This is not a requirement when in Study mode.
4. Select the **Release** and **Complete** buttons on the safety document. New safety state transition steps are recorded into the Steps list for the Release and Complete operations.
5. Close the safety document.

   Note: If you changed the Other Devices or Description field, you will be asked to save the changes. All other fields are automatically saved within the associated switching steps.

For instructions on executing safety state transition steps, see **Executing Safety State Transition Steps** on page 11-115.

Safety State Transition Failed Dialog Box

When a safety document is issued the conditions (tags and grounds) associated with it are locked. If some of the expected conditions are missing or fail to lock, the Safety Transition Failed dialog box is displayed. The Failed Safety Actions table contains the list of switching steps associated with the safety document, that caused the failure.

The switching steps placing those conditions will be highlighted on the Steps tab. Affected rows in the Tag Points and the Ground devices lists in the safety document will also be highlighted.

Editing the Device List

The **Tag Points** and **Grounds** device lists on the Hot, Hold, Clearance, Delegated Control, Information, and Warning safety documents may only be altered when in the **New** or *Unissued* states.

Adding Devices to a Non-Execute Safety Document

You can add additional devices to a safety document through one of three ways.

- The first method involves associated steps with devices to the safety document. The second method allows you to added devices directly to the safety document through device selections in the Viewer. The third method uses the Add Device dialog box, from which you can enter or search for a device to be added to the list.

Step Association Method

The step association method is accomplished by doing the following:

1. Open a non-execute version of a safety document. (A non-execute version is loaded from the Safety Lists and the Control Tool. It displays a toolbar at the top of the dialog box and no Execute button at the bottom.)

   From the associated switching sheet steps list, select the step with the device operation you want added to the safety document. For example, if you select an Add or Remove Tag step, the devices is added to the Tag Points list on the safety document dialog box. If you select a Ground step, the device is added to the Grounds list.

2. Click the **Link Switching Step Device** button ( ) on the safety document dialog box. The new device is added to the appropriate device list.

   Notes:

   - If the selected step is already associated to a safety document, then an error dialog box indicates which safety document the step is already associated to.
   - If the select step type is not configured for the safety document type, then an error will be displayed indicating the step that does not conform to the configured step to safety document type rules. For a list of step types to safety document types, see **Mapping Step Types to Safety Document Types** on page 11-103.

Device Recording Method

The device recording method is accomplished by doing the following:

1. Open a non-execute version of a safety document. (A non-execute version is loaded from the Safety Lists and the Control Tool. It displays a toolbar at the top of the dialog box without an **Execute** button.)
2. Click the **Record** button on the Tag Points toolbar to turn recording on for that device list.

3. In the Viewer, select devices that should be added to the Tag Points device list.

Safety Document Add Device Dialog Method
Using the Safety Document Add Device dialog box, devices can be added to the Tag Points list by doing the following:

1. Open a non-execute version of a safety document. (A non-execute version is loaded from the Safety Lists and the Control Tool. It displays a toolbar at the top of the dialog box without an **Execute** button.)
2. Click the **Add Device…** button ( ) found on the Tag Points toolbar. The Safety Document Add Device dialog box is displayed.
3. From the dialog box, enter part or all of a device alias. The search button () can be used to find a device from a partial device id.
4. Select the appropriate phases for the device.
5. Click **Add Device** (). The device will be added to the Tag Points list with the indicated phases.
6. Continue to add devices and when completed, click **Close**.

Removing Devices

You can remove devices from a device list in two ways.

Option 1

1. Open a non-execute version of a safety document. (A non-execute version is loaded from the Safety Lists and the Control Tool. It displays a toolbar at the top of the dialog box without an **Execute** button.)
2. Select the device you would like to remove from the Tag Points or Grounds list.
3. Click the **Remove Device** button ( ) from the appropriate device list toolbar. The device is removed from the list if the document is in the New state or is marked for removal if the document is in the Unissued state

Option 2

1. From the associated switching sheet steps list, select the step with the device operation that you want removed from the safety document. For instance, if you select an Add or Remove tag step, the device will be removed from the Tag Points list. If you select a Ground step, the device will be removed from the Grounds list.
2. Click the **Unlink From a Safety Document** button ( ) on the **Steps** tab toolbar. The device is removed from the safety document's device list if the document is in the New state or is marked for removal if the document is in the Unissued state.

   Note: The **Unlink From a Safety Document** button can only be used for devices in the safety document that are associated to steps. Devices added without step associations will have to be removed using Option 1 described above.

Adding a Comment to the Audit Log

The Comment section of the Audit Log pane allows you to add a comment to the log. Select the Comment field and enter a comment; click the **Add** button (+) to add the comment to the Audit Log.

Executing Safety State Transition Steps

Once a safety state transition step has been recorded, executing (completing) the step causes the Execute Safety Step dialog box to be displayed. This dialog box looks just like the original safety document dialog box except that it has no toolbar and it displays two buttons: **Execute** and **Cancel**. Use this dialog box to verify that the safety document information is correct, and then click **Execute** to execute the step.

When a tag step with an associated safety document is executed, the Control Tool executes placement of the appropriate tag (Hold, Hot, Clearance, and so on) on the device. The symbol on the device indicates that a condition exists on the device, that the area has not been issued to the crew, and is not yet isolated. After the safety document has been issued, the symbol on the device changes to indicate that the tag is under the control of the safety document. For example, if configured in your project, a Hold tag may change to indicate Hold with a small lock symbol next to it. When a tag changes to a locked state, the safety document must be released before the tags can be removed using the Control Tool. Likewise, when the safety document is transitioned to the Unissued state, the tag symbols on the devices will change to indicate that they are still part of an active safety document, but are in a state to where they can be removed; they are allowed to be removed so that the zone of coverage for the safety document can be altered while in the Unissued state.

For more information, see one of the following topics:

- Issuing Safety Documents While Executing Steps
- Releasing Safety Documents While Executing Steps

Issuing Safety Documents

Safety documents are issued when an Issue safety document switching step is completed and the **Execute** button is clicked on the safety document.

> **Note**: The appropriate tag type must be placed on the device prior to the safety document being issued. For example, to issue a Hold document, you must place a Hold tag on the device before the safety document can be issued. This only pertains to devices associated to switching steps. Devices not associated to steps will automatically have conditions placed on the them when the document is issued.

When a safety document is transitioned from the Unissued state to the Issued state, all of the pending device list changes will be applied. If the transition is initiated in real-time mode, then any devices marked for removal will be removed from the list and related audit log entries will be created for each device change.

Once a safety document is issued:

- Crews are transitioned to the "Issued" position.
- You cannot complete, delete, or reissue the safety document. The device lists cannot be altered while in the Issued state.

- The only state related button options available on the safety document dialog box are **Unissue** and **Release**.
- The Viewer displays a symbol on all devices that are specified in the safety document to indicate that the safety document has been issued.

Grounds Check

When an attempt is made to issue a safety document, the devices listed in the Grounds list are all required to have grounds. The document cannot be issued until the grounds exist on the listed devices. Once the safety document is issued, the grounds on those devices cannot be removed without acknowledging that they will be removed out from under an issued safety document. The Grounds Check dialog box is displayed to the user when they attempt to remove the last ground on a device that is linked to an issued safety document. If the device has multiple grounds, then only the last ground to be removed will be flagged as being required by a safety document.

The Grounds Check dialog box will give you a list of safety documents linked to the ground that is about to be removed. Double clicking on any of the safety document entries will cause the document to be loaded. You can also right-click on the entry and select the **Open...** menu option.

If you determine that the ground can be safely removed out from under the listed safety documents, then select the **Continue** button. This will cause the ground to be removed and audit log entries will be added to each of the affected safety documents indicating when, on which device and who removed the ground condition. The **Cancel** button can be pressed to cancel the entire Remove Condition operation.

Issuing Safety Documents Manually

To issue a safety document manually:

1. Open the safety document (if it is not already open) by selecting the document on the Safety Documents tab and clicking the **Open** button.
2. Click **Issue** on the open safety document. A symbol appears on all devices that are specified in the safety document to indicate that the safety document has been issued.

   Note: If you manually Issue a safety document in real-time mode, a safety state transition step is automatically recorded to the Steps list, regardless of whether step recording is turned on. This is the audit of the safety documents transitions.

Issuing Safety Documents While Executing Steps

To issue a safety document through step execution:

1. From the Steps List, select the Issue safety state transition step and click the **Complete** button. The Execute Safety Step dialog box opens, and the **Execute** and **Cancel** buttons are enabled.

   Note: When instructing safety state transition steps in real-time mode, the safety document dialog box is not displayed. It is only displayed when the step is completed.
2. Click the **Execute** button. A symbol appears on all devices in the Viewer that are specified in the safety document to indicate that the safety document has been issued. The safety state transition step is also marked as Completed.

If any of the devices in the Tag Points list were not associated to switching steps, then conditions will be applied to the devices first. After all the conditions are on the devices, then the conditions will be changed to indicate that they are under the control of the safety document.

Releasing Safety Documents

Safety documents are released when switching steps associated to a releasing safety document are completed and the safety document's **Execute** button is clicked. The symbol for the safety document is removed from the device in the Viewer and the original tag symbols are placed back onto the device. At this point the Safety Document can either be reissued to a different crew or completed.

> **Note:** Safety Documents cannot be released if any crews are still in the "Issued" position. Crews need to be "Clear" to proceed.

Releasing Safety Documents Manually

To release a safety document manually:

> **Note**: The document must already be issued before it can be released.

1. Open the safety document (if it is not already open) by selecting the document on the Safety Documents tab and click **Open**.
2. In the safety document, click **Release**. The symbol for the safety document is removed from the device and the original tag symbols are placed on the device.

   > **Note**: If you manually release a safety document in real-time mode, a safety state transition step is automatically recorded to the Steps list, regardless of whether step recording is turned on. This is the audit of the safety documents transitions.

Releasing Safety Documents While Executing Steps

To release a safety document through step execution:

1. From the Steps List, select the Release safety state transition step and click **Complete**. The Execute Safety Step dialog box opens, and the **Execute** and **Cancel** buttons are enabled.

   > **Note**: When instructing safety state transition steps in real-time mode, the safety document dialog box is not displayed. It is only displayed when the step is completed.

2. Click **Execute**. The symbol for the safety document is removed from the devices and the original tag symbols are placed on the devices. The safety state transition step is also marked as Completed.

Deleting a Safety Document

Safety documents can be marked as Deleted from the associated switching sheets Safety Documents tab. Safety documents can only transition to the Deleted state when they do not have safety state transition steps linked to them in the switching sheet's Steps list. Attempting to mark a safety document as Deleted with linked safety state transition steps will result in an error dialog box. You will need to delete the safety state transition steps before the safety document can be marked as Deleted.

To mark a safety document as Deleted:

1. Navigate to the associated switching sheets **Safety Documents** tab.

2. From the safety documents list, select the document entry, and click **Delete**. The document will be marked as Deleted. Safety documents can only be marked as Deleted when in the New state.

Delegating Control of a Network Area

When you issue a DCZ Safety document, the system delegates the segment of the network bounded by the listed devices. No operations are allowed on any devices in the segment until the document is released.

> **Note:** All of the conductors in the delegated area recolor to the *Delegated* color, which can be seen in the Viewer Legend (see **Changing the Coloring Mode** on page 2-62 for additional information on Viewer coloring).

Your devices must completely bound an area to be considered adequate for Delegated Control. That is, there should be no alternate way to feed any of the devices in the area. This can be a lot of devices if you model secondary backfeed devices.

> **Note:** If you do not want to select these backfeed devices, make those device classes inherit from `implicit_isolate` in your `<project>_inheritance.dat` file.

Safety Document List

The Safety Document List is a tool used to manage active safety documents and any safety documents associated to switching sheets that have been completed in the last 30 days. To load safety documents no longer available in the Safety Document List, use the Search Safety Document window.

The Safety Document List will load the full list from the database when it is first displayed. After the initial load of the data, the list will dynamically update with changes from all users on the system. Dynamic updates happen periodically at 15 second intervals. A safety document's updates will only be broadcast out to the other users once it has been saved to the database.

The full list of safety documents will be queried from the database when you alter your subscribed zones via the Authority tool. The full list will also be queried if you select the **Refresh** button from the **Actions** menu. Once the full list has been loaded, the list will go back to being dynamically updated.

The Safety Document List serves as the primary mechanism from which to load safety documents outside or not associated to switching sheets. You can either double click on a single entry or highlight multiple entries and click the **Open...** toolbar option.

> **Note:** When loading multiple safety documents, a progress bar will be displayed at the bottom of the window.

Once an open request has been initiated, it cannot be canceled, but the system does restrict you from having more than 15 switching sheets open at any one time. Each safety document is linked to a switching sheet.

The Safety Document List will be filtered based on the control zones you are subscribed to. The device listed on the parent sheet's **Request** tab determines the control zone that a safety document is associated with; however, if no device is entered, then the safety document will fall within the FUZZY zone.

Menu and Toolbar Features

This section lists and describes the menu options and toolbar icons available in the Safety Document List.

File Menu

The table below describes the options available on the File menu.

Menu Option	Description	Icon
Open...	Opens the selected safety documents and their associated switching sheets. If the window is not pinned or docked, the window will be closed once the safety documents are loaded. **Note:** If the safety is locked by another user, the Failed to Establish User Lock dialog box will be displayed; see **Opening Locked Documents** on page 11-97 for information.	
Export Table...	Opens a dialog box to allow you to save the current table view data to a comma separated value (csv) file.	
Print	Displays the Print Preview dialog box so you can view or print the list.	
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	
Exit	Closes the Safety Document List window.	--

Sort Menu

The table below describes the options available on the Sort menu.

Menu Option	Description	Icon
Sort Dialog...	Opens the Sort dialog, allowing you to create, modify, apply, and save user-defined sorts. See **Using the Sort Dialog Box** on page 1-9.	--
Doc #	Applies the default sort, which is the doc # in descending order.	--

Actions Menu

The table below describes the options available on the **Actions** menu.

Menu Option	Description	Toolbar Icon
Refresh	Refresh the safety document list with the latest data from the database.	
• **Unpin**	• Unpin the window so that it will close after an open safety document request.	
• **Pin**	• Pin the window so that it will not close after an open safety document request. **Note:** The icon shows the current state (that is, unpinned).	

Help Menu

The table below describes the options available on the Help menu.

Menu Option	Description	Toolbar Icon
Safety Document List Help	Opens the online help system to the Safety Document List help content.	--

Safety Document List Data Fields

The Safety Document List provides a tabular view of the safety document. The sort and filter criteria are displayed above the table.

- The **Status** column displays the status of the safety document.
- The **Type** column displays the safety document type.
- The **Doc #** column displays the safety document number.
- The **Sheet #** column displays the switching sheet the document is associated to.
- The **Nominal Feeder**, **Current Feeder**, **Nominal Substation**, and **Current Substation** columns display values as displayed on the safety document.
- The **Issued Date** column displays the date the document was last issued.
- The **Crews** column displays the crews the document was issued to.
- The **Description** is the description of the safety document as entered on the document.
- The **Released Date** displays the date the document was last released.
- The **Completed Date** displays the date the document was completed.

Understanding the Safety Document List Filter Pane

The Safety Document List provides the following Global filters.

Global Filter	Description
Active	Displays all the active safety documents (safety documents with statuses of Issued, Unissued, and Released).
All	Displays all safety documents and safety documents associated to completed switching sheets from the last 30 days.
Completed	Displays safety documents that are in the Completed state that are not associated to a switching sheet that has been completed longer than 30 days.
Issued	Displays all safety documents in the Issued state.
New	Displays all safety documents in the New state.

Opening Existing Safety Documents

Note: If the sheet is locked by another user, the Failed to Establish User Lock dialog box will be displayed; see **Opening Locked Documents** on page 11-97 for information.

From the Web Workspace File Menu

1. Select **Open** and then **Safety Documents…** The Safety Documents List appears.
2. Select the safety document you want to open and click the **Open** button or double-click on the document in the list. The safety document is opened. If the safety document is associated with a switching sheet, the switching sheet will also open.

From the Web Workspace Search Safety Document Dialog

To search for an existing safety document:

1. From the Web Workspace **File** menu, select **Safety Document Search...** from the **Open** option.
2. In the Search Safety Document dialog box, enter the desired text to search and press **Enter** or click the **Search** ( ) button.

   Note: The search results will be filtered based on the parent sheet's master device NCG and your subscribed zones of authority. The NCG for stand alone safety documents will be determined by the device populated in the safety document's **Device** field. The filtering of the results, based on NCG, will not apply to the Administration user type.

Open a Safety Document from an Open Switching Sheet

1. Click the Safety Documents tab.

2. Select the safety document you want to open and click the **Open** button or double-click the document in the list. The safety document dialog box is displayed.

Open a Safety Document from a Switching Step on the Steps Tab

1. Right-click on one or more steps that have safety document associations, then select **Load Safety Documents…** from the context menu. The safety document dialog boxes are displayed.

   Note: Steps with associated safety documents display the document type and number displayed in the Operation step column.

Open a Safety Document from the Control Tool

1. For active safety documents, double-click a device in the Viewer.
2. From the Control Tool, click **Safety Documents…** and then select **Open Safety Documents...** from the submenu.
   - If only one safety document is currently active on this device, then the safety document dialog box is displayed.
   - If multiple safety documents are active, the Device to Safety Document List displays a list of safety documents for the device. The list includes only safety documents that are part of an active sheet and documents that were completed in the last 30 days. Select the safety document you want to load from this list.

   The safety document and the associated switching sheet are opened. The safety document will be opened in the same mode that the Control Tool is in.

Completing Safety Documents

When you have completed all steps in a switching sheet, you should complete all safety documents associated with the sheet.

To complete a safety document, use either of the following methods.

Option 1

1. Follow the steps described above to open the safety document.
2. Click the **Complete** button on the safety document dialog box.

   Note: Once completed, the document is locked from further editing. When manually completing a safety document in real-time mode, the action is automatically recorded in the associated switching sheet's Steps list.

   Any devices in the Tag Points list, that were not associated to steps, will have their conditions removed.

3. Repeat these steps for all safety documents associated with the switching sheet.

Option 2

1. Record a Complete safety state transition step (as described in the previous sections) and use that step to complete the safety document. Repeat for all safety documents associated with the switching sheet.

Aborting Safety Documents

If a switching sheet is aborted, you will need to abort any associated safety documents before you can complete the switching sheet.

> **Note**: The Abort option is only available in real-time mode when the safety document is in the New state.

To abort a safety document, follow these steps:

1. Click the Safety Documents tab.
2. Double-click the safety document you want to abort.
3. Click the **Abort** button on the toolbar.
4. When prompted, confirm you action.

Switching Sheet Associations

Safety documents can be associated to different switching sheets and even disassociated and converted into a stand alone safety document. Safety documents can only be associated to different sheets or disassociated if the safety document does not have any switching sheet step links. An error will be issued to you if you attempt to disassociate or move a safety document that has linked switching sheet steps. A safety document's type and number will be displayed in the step's Operation column if a link exists.

When disassociating a safety document from a switching sheet, a confirmation dialog box will be displayed to you. You must confirm the operation before the disassociation will proceed. When the document is disassociated, it will be converted into a stand alone safety document. The audit log of the switching sheet and the safety document will indicate when and who initiated the operation.

Safety document associations originate from the Switching Sheet Association dialog box. This dialog box allows you to select a sheet from a list of switching sheets you already have loaded or you can search for a particular switching sheet in the system. Completed switching sheets and switching sheets that cannot accept safety document associations will be filtered out of the list. Safety document association changes will result in audit log entries in the original switching sheet along with the target switching sheet and the safety document.

Outage Correction

Web Switching Management can be used for outage correction. After an outage is completed, you can either correct the associated outages by transitioning the plan to the Rework state and clicking the Correct Outage button, or you can create a new Outage Correction sheet and re-record steps to replace a single selected outage.

Correcting Outages in a Rework Sheet

When you transition your sheet to the Rework state, a **Correct Outage** button ( ) will appear on the Steps tab. Change step times or use the Find/Replace dialog box to change devices and phases, then click the Correct Outage button to update the event with the new customer counts.

Due to the complicated nature of the grouping algorithm, the steps and event relationships need to remain unchanged. That is, if step 6 originally restored the outage created in step 2, then step 6 needs to continue to restore the outage created in step 2. The **Events** column appears when the sheet is in Rework mode to help clarify this situation.

Using Outage Correction Sheets

After you create a new Outage Correction sheet, you will re-record the outage restoration sequence in study mode. Although the scenario is recorded in study mode, the corrections will be made to the real-time outage. Study mode is used so that the model can be altered to resemble the real conditions when the outage was created.

> **Note:** In order to use Outage Correction, you will need to have access to an available study session.

Re-Recording the Outage Restoration Sequence in Study Mode

To re-record the correct outage restoration sequence, follow these steps:

1. In your study mode Viewer, manipulate the model to represent what the conditions were when the outage was created. This will be used as your template to record a new scenario into the Outage Correction sheet.
2. Open Event Details for the completed event, click the **Switching…** button. The Open Or Create New Switch Sheet dialog box is displayed. Select the **Outage Correction** sheet type and then click the **Create** button. An Outage Correction switching sheet is created for the event.
3. In the Outage Correction switching sheet, turn recording on.
4. Record the entire set of corrected outage and restoration steps in the Viewer, using the Control Tool's date/time selector to set the correct operation times.
5. Manipulate the model back to the baseline, as in step 1. This is important because the algorithm plays the steps against the current study network to determine the customers affected. Use the Impacted Customers tab to verify that the correct number of customers will be impacted by the new set of steps.
6. Click the **Correct Outage** button on the Steps tab toolbar. A confirmation dialog box appears.

7. Click **OK**. The system validates the plan and, if successful, replaces all affected customer data for the related outage and updates the new outage time, customer count, and outage device. The Event Details, when re-loaded, will reflect any partial restoration changes as well.

   Note: If you are replacing an outage that was involved in a partial restoration scenario, you will need to either update the other related outages or mark them so that they are not reported and calculated in your indices.

Outage Correction Error Codes

The **Correct Outage** button performs a number of validation actions that can result in errors and warnings.

- Outage Correction sheets must be associated with an event.
- The chosen event must be in the completed state.
- The outage time but be at least one second before the restore time .
- All customers outaged by the new steps must also be restored.
- Original customer calls must be affected by the new steps and must fit within their outage and restoration times.
- Customers who called in the original event are no longer in the model.
- Devices used in the new steps were not valid at the time of the original event.

Using the Miscellaneous Log

The Miscellaneous Log automatically records all real-time switching actions that are not recorded in any switching sheet. The miscellaneous log does not need to be open for steps to be recorded; the system automatically detects steps performed in real-time that are not being recorded in a switching sheet. You can use the miscellaneous log rather than creating emergency switching sheets.

This section includes the following topics:

- Displaying the Miscellaneous Log
- Filtering the Log
- Editing the Miscellaneous Log Steps

Displaying the Miscellaneous Log

To view the Miscellaneous Log, select **Miscellaneous Log...** from the **Tools** menu. The Miscellaneous Log displays the same columns as a switching sheet Steps tab with the addition of an Events column. The steps list does not have a Version column as miscellaneous logs do not have versioning capabilities. See **Steps Tab** on page 11-28 for column descriptions.

The following fields and buttons are displayed at the top of the Miscellaneous Log tab.

- The **From** date picker, **Range** drop-down list, and the **All Users** check box set the log's filter criteria. Note that the **From** date picker only includes dates, but not specific times.
- The **Fetch** button ( ) is used to get records from the database.
- The **Previous** ( ) and **Next** ( ) buttons allow you to view the log entries for the previous or following period. For example, if the number of days drop-down list is set to 1 week, then clicking the Previous button displays the previous week's log entries.
- The **Complete** button ( ) completes the selected instructed steps. The status of the step changes to *Completed*.
- The **Abort** button ( ) sets the status of an instructed step to *Aborted*. Use this if the step was never attempted.
- The **Fail** button ( ) sets the status of an instructed step to *Failed*. Use this if the step was attempted but failed.
- The **Uninstruct** button ( ) will remove the instruct condition from the device and delete the instructed step that was recorded into the Miscellaneous Log.
- The **Focus** button ( ) focuses the Viewer on the selected device.
- The **Cut** button ( ) allows you to cut one or more steps from the miscellaneous log. You can then paste the steps into another switching sheet.
- The **Print Preview** button ( ) allows you to generate and view the Miscellaneous Log report based on any applied filters. The output will include the date range for the steps included in the log, the user, and finally the list of steps. You will be prompted to select a report format (PDF, HTML, RTF, or

XML); click **Preview...** to generate the file, which will open in an application that is associated with that file type (for example, Adobe Reader for PDFs or your default web browser for HTML). You may save the generated file.

Note: The filters will be refreshed when the report is generated so they will always contain current data regardless of what steps are displayed at the time the button was clicked.

- The **Print** button ( ) allows you to print the Miscellaneous Log report based on any applied filters (see **Note** for **Print Preview**, above). You will be prompted to select a report format (PDF, HTML, RTF, or XML) and your printer; click **Print**.
- The **Email** button ( ) allows you to email the Miscellaneous Log report based on any applied filters (see **Note** for **Print Preview**, above). You will be prompted to select a report format (PDF, HTML, RTF, or XML); click **Email...** to generate the file, which will be attached to a new message launched from your default email application.
- The **Help** button (?) displays help for the Miscellaneous Log tab.

Filtering the Log

Use the fields at the top of the Miscellaneous Log tab to filter the list as follows:

1. Select a starting date from the **From** date picker.
2. From the drop-down list, select the number of days from that starting date for which you want to see log entries.
3. Check or uncheck the **All Users** check box. (When **All Users** is checked, the log shows steps that were executed by all users; when unchecked, the log shows only steps that were executed by you.
4. Use the fields at the top of the tab to filter the log.
5. Click the **Fetch** button to refresh the list based on your entries.

Editing the Miscellaneous Log Steps

The **Operation**, **Details**, and **Comments** step columns are the only columns in the Miscellaneous Log that can be edited. The edits are automatically submitted to the database when cell focus is lost. Cell focus occurs when you press **Enter** or when you tab out of the field. The cell edit will also be submitted to the database if you navigate to another tab within the Oracle Utilities Network Management System environment. Step field edits within the Miscellaneous Log cannot be undone. If you wish to cancel what you are doing in the Comments field, then press the **Esc** key. Note that editing the **Operation** step column can only occur for No-Op steps just as it is in switching sheet steps. Once edited, the background color for the step will turn yellow to indicate that the default Operation text has been altered.

Viewing Global Overlaps

The Global Overlaps list allows you to identify overlaps of date/time, control zone and affected devices within a specific time period for all active switching sheets.

To display the Global Overlaps list, choose **Switching Overlaps...** from the **Tools** menu.

The fields, buttons, and options on this tab are nearly identical to the Overlaps tab that is displayed for individual switching sheets. See **Using the Overlaps Tab** on page 11-72 for more information. The global overlaps Range options will only include options that will add to the specified From date. Switching sheet overlaps include Range options that are before and after the sheet's start and finish dates. The table column labels will be followed by a 1 or 2 depending on which switching sheet the value is for.

The Global Overlaps list will initially display overlaps for the next day and any overlaps that occur over time. Use the Overlap Type column in the list to determine overlaps that have been scheduled for the same device and/or control zone. The Device and Control Zone overlaps will be listed at the top of the list.

To open the overlapping switching sheets, double click the entry in the list or use the right-click context menu to select options for opening Sheet #1, Sheet #2, or both sheets.

Click the Help button (?) to display help for the Global Overlaps tab.

Web Safety

Web Safety provides *Stand Alone Safety Documents* for recording tagging and grounding operations outside of a switching plan. **Web Safety** is not a substitute for safety documents created in switching plans and, therefore, does not support the use of aggregate actions when recording tag points and grounding actions. **Web Safety** limits device associations to those not involved in *Open* and *Close* operations.

Understanding the Stand Alone Safety Document Window

Stand Alone Safety Documents windows share many features and behaviors of switching sheet windows. Like switching sheets, Stand Alone Safety Documents cannot be moved outside of the confines of the NMS workspace. Stand Alone Switching Document windows open in the lower right quadrant of the workspace, but may be moved anywhere within the workspace or maximized to the full workspace dimensions.

Each open safety document has its own tabbed window, which is labeled with a combination of the safety document type and the number. Multiple safety documents and switching sheets are typically docked together and displayed as a tab group. Double-click any tab (or the empty area to the right of the tabs) to maximize the tab group; double-click again to restore the size.

Right-click a tab to access the context menu, which provides the following:

> **Note:** For simplicity, the term *sheet* will be used to mean either a stand alone safety document or switching sheet.

- **Maximize:** maximizes the window.
- **Restore:** restores the maximized window to its original size and position.
- **New Tab Group:** displays the sheet separately.
- **Collapse Tab Groups:** regroups separate windows into tab groups.
- **Windows...:** opens a dialog box that lists all open sheets, which you can then:
  - Activate (that is, bring to front in a tab group) a single sheet.
  - Close selected sheets.
- **Close:** closes the sheet.
- **Close All:** closes all open sheets.
- **Close Others:** closes all open sheets except the sheet that was right-clicked.

Menu and Toolbar Features

File Menu

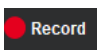
The table below describes the options available on the **File** menu.

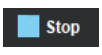
Menu Option	Description	Toolbar Icon
Save	Saves the Safety Document.	
Copy As...	Opens the Safety Document Types dialog box that allows you to create a new safety document with the current document's data. See **Copying a Safety Document** on page 11-138 for more details.	--
Associate...	Display the Switching Sheet Association dialog box. From the dialog box you can associate the safety document to a switching sheet. See **Switching Sheet Associations** on page 11-123 for more details. Once the safety document is associated, it is no longer a stand alone safety document and when viewed the document takes on the look of a switching sheet associated safety document.	
Delete	Transition the document to the Deleted state and remove it from any of the safety document lists. This option is only available while the document is in the New state.	--
Print Preview...	Opens the Report Format dialog box that allows you to choose the criteria for previewing a safety document report.	
Print...	Opens the Report Format dialog box that allows you to choose the criteria for printing a safety document report.	
Email...	Opens the Report Format dialog box that allows you to choose the criteria for emailing a safety document report.	
Exit	Closes the active safety document.	--

Help Menu

Option	Description	Toolbar Icon
Web Safety Help	Opens online help content for safety documents.	--
About Web Safety	Opens a window with environment and software information.	--

Toolbar Buttons

- The 

/ 

buttons allow you to toggle Control Tool related recording on or off, respectively.

- The **Paste** button ( ) allows you to add a step cut from the Miscellaneous Log or copied from another Safety document. See **Adding Devices to a Non-Execute Safety Document** on page 11-113 for more information.
- The **Place Condition** button ( ) is used to apply conditions when the condition actions were recorded in study mode through the Control Tool.
- The **Issue** button ( ) issues the selected safety document. A record of the transition is added to the Audit Log. Selecting this button will cause the **Unissue** and **Release** buttons to be enabled.
- The **Unissue** button ( ) is used to place an Issued safety document or a Released safety document into an Unissued (edit) state where the device lists can be altered. While in the Unissued state, you can add devices to the lists and mark devices already in the list for removal. Only when the safety document transitions back to the Issued state will the changes be applied. Selecting this button will cause the **Issue** button to be enabled.
- The **Release** button ( ) releases the selected safety document. This button is only enabled if the safety document has been issued. Selecting this button will cause the **Issue** and **Complete** button to be enabled.
- The **Complete** button ( ) completes the selected safety document.
- The **Abort** button ( ) allows you to set the status of the safety document to Aborted. The system prompts you to confirm the action before aborting. This button is only available in real-time mode and only for safety documents that are in the New state.
- The **Confirm Model Changes** button ( ) becomes available when model changes have occurred that impact one or more devices in the safety document.

The Web Switching service checks all the active safety documents after a model edit has occurred. If a safety document has a device that matches a device that was directly impacted by a model change, that device will be marked as needing verification. When the safety document is displayed, these devices will be highlighted in yellow. You can either verify each device in the document or verify the entire document.

> **Note:** While the safety document has verifications pending, safety state transitions cannot be performed within the document.

Any device related field values that are pulled from model or attribute data will be dynamically updated after the model change. This includes the **Feeder** and **Substation** fields.

Individual Verification

To check off each device individually, right-click the highlighted device and select **Model Verify**.

Whole Safety Document Verification

To verify all of the devices in a sheet, click the verify (check mark) button ( ) to confirm all model changes. All highlighted devices will be marked as verified.

Once the devices have been verified, safety state transitions can continue for the document.

- The **Reset Study Session** ( ) allows you reset your study session to a copy of either Real Time or Nominal conditions.
- The **Real Time** button ( ) switches the document to real time mode.
- The **Study Session** button ( ) switches the document to study mode.
- The **Step Actions** button ( ) toggles the actions view at the bottom of the safety document. The actions are identical to switching steps found in switching sheets. The actions list includes the tag, ground, and safety state transition actions associated to the document.

Safety Document Fields

The Stand Alone Safety Document dialog box displays the following fields:

- **Tag Points** display the devices that the safety document is associated with.
  - **Table Columns**
    - **Edit State:** an iconic representation of the edited state of the device in the Unissued state. The edits will be applied when the document is issued. When working in Study mode, the edit state indicators will remain visible until the document is issued in real time.
      - **:** The device has been marked for removal.
      - **:** The device has been added to the device list and will be used as a boundary point the next time the document is issued.
    - **Device:** the device used to define the area or point of coverage of the safety document.
    - **Phases:** the device phases affected.
  - **Toolbar Buttons**
    - The Record / Stop buttons allow you to toggle recording of devices on or off, respectively. The Tag Points list allows you to record devices by selecting them in the Viewer. To enable this feature, turn on recording and select devices in the Viewer.
    - The **Add Device...** button ( ) allows you to manually add a device to the list.
    - The **Undo Device Edit** button ( ) allows you to undo an addition or removal of a device from the list. This option is only available when making device modifications in the Unissued state.
    - The **Remove Device** button ( ) allows you to remove a selected device from the Tag Points device list.
    - The **Change Phases** button ( ) brings up a Select Phases dialog box. From the dialog box, new phases for the device can be selected. See Select Phases Dialog Box for details.
  - The **Object Focus** button ( ) focuses the Viewer 1 window on the selected device.

- **Grounds** displays the devices that the safety document will protect and validate the grounds on.
  - **Table Columns**
    - **Edit State (untitled):** an iconic representation of the edited state of the device in the Unissued state. The edits will be applied when the document is issued. When working in Study mode, the edit state indicators will remain visible until the document is issued in real time.
      - : The device has been marked for removal.
      - : The device has been added to the device list and will require a ground condition the next time the document is issued.
    - **Device:** the device that should be protected with a ground before the document can be issued.
    - **Phases:** the device phases to be checked.
  - **Toolbar Buttons**
    - The Record / Stop buttons toggle recording of devices on or off, respectively. The Tag Points list allows users to record devices via selections from the viewer. To enable this feature, simply turn on recording and select devices in the viewer.
    - The **Add Device...** button ( ) allows you to manually add a device to the list.
    - The **Undo Device Edit** button ( ) allows you to undo an addition or removal of a device from the list. This option is only available when making device modifications in the Unissued state.
    - The **Remove Device** button ( ) allows you to remove a selected device from the Grounds device list.
    - The **Change Phases** button ( ) brings up a Select Phases dialog box. From the dialog box, new phases for the device can be selected. See Select Phases Dialog Box for details.
    - The **Object Focus** button ( ) focuses the Viewer 1 window on the selected device.
- **Other Devices** is a text field that allows you to enter a list of non-modeled devices.

  Note: An entry is required in at least one of these fields: Grounds, Tag Points, or the Other Devices.
- **Nominal Feeders** field allows you to enter feeder values and can also be automatically populated with nominal feeders associated to the devices listed in the **Tag Points** and/or **Grounds** list. The following button is displayed to the right of the Feeders field:
  - The **Update** button ( ) is used to populate the **Nominal Feeders** field with the list of feeders associated with devices listed on the safety document.

- **Nominal Substation** displays the nominal substations for the devices listed in the **Tag Points** and/or **Grounds** list. To alter this value, enter your new value into the field.
  - The **Update** button ( ) is used to populate the **Nominal Substation** field with the list of substations associated to the devices listed on the safety document.
- **Current Feeders** displays the current feeders for the devices listed in the **Tag Points** and/or **Grounds** list. This value is read-only and will dynamically update as long as the safety document is loaded.
- **Current Substation** displays the current substations for the devices listed in the **Tag Points** and/or **Grounds** list. This value is read-only and will dynamically update as long as the safety document is loaded.

  Note: See **Device Associations with Nominal and Current Network Components** on page 11-2 for information.
- **Device** displays the devices being worked on (not necessarily the device being switched). This device is also used to identify what control zone the document is found in. If you do not have authority over the zone the document is associated to the document will not show up in the Open Safety Document list. The following buttons are displayed to the right of the **Device** field:
  - The **Devices Lookup** button ( ) is used to search for and select a device.
  - The **Link Device** button ( ) to link a device selected from the Viewer to the switching sheet. Select the device in the Viewer, and then click the **Link Device** button ( ). The **Device** field is populated with the selected device's name.
  - The **Unlink Device** button ( ) clear a linked device from the **Device** field.
  - The **Object Focus** button ( ) focuses the Viewer 1 window on the selected device.
- **Assigned Crews** displays a table list of the Crew IDs of the crews that the safety document has been issued to, as well as each crew's mobile number, mobile carrier, alternate number, alternate number type, pager number, and crew type. A crew is required in this list before the document can be issued.
  - To select a crew to assign to this safety document, click the **Select Crew...** ( ) button to open the Select Safety Crew dialog box. See **Assigning Crews to a Safety Document** on page 11-110.
  - To change a crews position, click the **Crew Issued/Clear** ( ) button and select either **Issued** or **Clear** from the context menu.
  - To delete crews from this list, click the crews and then click the **Clear Crew**s button ( ). When the document is in the Issued state, all but the last crew can be cleared from the list. At least one crew must remain assigned while the document is in the Issued state.
- **Description** is a text field that allows you to enter notes for the safety document.
- **Audit Log** contains the following information:

- **Table Fields:**
  - **Date**: the date and time of each entry.
  - **Description:** a description of the state change or device operation.
  - **Device:** the device associated with the step.
  - **User:** the name of the user who recorded the action.
  - **Phases:** the phases affected.
  - **Crews**: the crew identifiers pertaining to the audit log entry.
- The **Comment** section of the Audit Log pane allows you to add a comment to the log.

- The **Edit Log** tracks the changes made to the entry fields of the document. It contains the following information:
  - **Date:** the date and time of each entry.
  - **User:** the name of the user who recorded the action.
  - **State:** the state of the safety document when the entry was added.
  - **Field:** The name of the field that was updated.
  - **Previous Value:** The previous value of the field before the update.
- The **Steps** section contains all of the step actions associated with the safety document.

Creating New Stand Alone Safety Documents

Creating a Safety Document from the Web Workspace

To create a new Stand Alone Safety Document from the Web Workspace, from the **File** menu, select **New**, and then select **Safety Document...** The *New Safety Document* window will open.

> **Note:** You may click the toolbar button ( ) rather than the File menu.

From the New Safety Document window, you may create a safety document based on a blank template or from a pre-existing safety document.

Create a New Blank Safety Document

To create a blank safety document from the New Safety Document dialog box, do the following:

1. Select a safety document type from the Safety Document Type list.
2. Click **Create**; the new safety document will open.

> **Note:** You may create a blank safety document from the Control Tool's **Safety Documents...** button. See **Creating a New Safety Document from the Control Tool** on page 11-136.

Create a New Safety Document with Existing Safety Document Data

You may want to create a new safety document with data from an existing safety document; for example, creating multiple safety documents types to be used in a multi-step switching operation.

1. Select a safety document type from the Safety Document Type table.
2. From the Pre-Created Safety Documents table, select an existing safety document that has the data you need for the new document.
3. Click **Create a Copy**; the new safety document will open and be populated with device data from the pre-created safety document. The **Create a Copy** button will only be visible after you have selected a safety document type and a safety document within the pre-created safety document list.

Creating a New Safety Document from the Control Tool

To create a new Stand Alone Safety Document from the Control Tool, do the following:

1. Make sure the Viewer is in Real Time mode. The safety document creation options are only available in Real-Time mode.
2. Open the Control Tool for the device to be associated with a new safety document.
3. Click the **Safety Documents...** button and then select the option to create the new safety document type:
    - Create HOLD Document
    - Create HOT Document
    - Create Clearance Document
    - Create Information Document
    - Create Warning Document
    - Create Delegated Control Document

A new safety document will be created with the Tag Points list automatically populated with the originating device's id and full set of phases. The safety document's **Device** field will be automatically populated with the source device used to bring up the Control Tool.

Using Stand Alone Safety Documents

Record Tag Operations

1. Create a new stand-alone safety document.

   Note: The new document will open in Real-Time mode with Control Tool action and Viewer device selection recording on.

2. Turn Tag Points Viewer device selection recording off.
3. Double-click a device in the Viewer to launch its Control Tool.
4. Click **Tag...** and choose a place tag operation associated to that document type. (For example, select **Place HOLD Tag** for a HOLD document.)

   The device is displayed in the Tag Points list.

5. Click the **Step Actions** toggle button ( ) and note that the operations are recorded there as well. This is the source list and this list feeds the Device and Ground lists found on the document's main form.

Record Ground Operations

1. Create a stand-alone safety document.
2. Turn Tag Points Viewer device selection recording off.
3. In real-time mode, with Control Tool action recording on, select a device in the Viewer and Place Tag operation associated to that document type. (For example, select a **Place HOLD** for a HOLD document.) The device is displayed in the Tag Points list.
4. Similarly, record a Grounding operation. The device used to place the ground is displayed in the Grounds list.
5. Click the **Step Actions** toggle button ( ) and note that the operations are recorded there as well. This is the source list and this list feeds the Device and Ground lists found on the document's main form.

Remove a Device from a Safety Document

1. Create a stand-alone safety document.
2. Record tagging and grounding operations in real-time.
3. Select one of the devices in the Tag Points list and click the **Delete** button ( ) to remove the device.

   Note: The *Remove* option is only available when the document is in the New or Unissued state.

4. Open the Miscellaneous Log and note that it now lists the Place Tag operation step that was removed from the safety document.

The associated action step will only show up in the Miscellaneous Log, after being removed, if the action was recorded from the Real-Time Control Tool. If the device was recorded as a selection from the Viewer, then the device will simply be removed and no action steps will be moved to the Miscellaneous Log.

Issuing, Releasing, and Completing a Safety Document

1. Create a stand-alone safety document.
2. Record some tagging and grounding operations in Real Time.
3. From the document, assign a crew to the document.
4. Issue the document. The conditions in the Viewer will change to indicate that they are under the control of a safety document by displaying a padlock symbol on top of the condition symbol. The status of the document is updated in the status bar, which is found at the bottom of the document. An audit log entry is created for the state transition.
5. Release the document. The conditions in the Viewer will change to indicate that they are no longer under the control of the safety document. The status of the document is updated in the status bar, which is found at the bottom of the document. An audit log entry is created for the state transition.
6. From the Viewer, remove the tagging and grounding operations while recording is on in the safety document. The actions are recorded in the Audit Log of the safety document.
7. Complete the document. The safety document status is updated and unlocked and placed into View Only mode. All the toolbar options are desensitized except **Copy As...**, **Print**, **Email**, **Help**, **Exit**, and **Focus**.

Loading a Safety Document

1. From the Open Safety Document list, load a safety document not associated to a switching sheet.

Deleting a Safety Document

1. Create a stand-alone safety document.
2. From the document's **File** menu, select **Delete**. The document will be marked as Deleted and will no longer be listed in the Safety Document List. Safety documents can only be deleted when no Real-Time tags or Grounds are associated and listed in the Tag Points and Grounds list.

Copying a Safety Document

Option 1

1. From the New Safety Document dialog box, refresh the pre-created safety document list.
2. Select a pre-created safety document and a target document type.
3. Click **Create a Copy**. A new safety document is created. This new document will have the same list of device as the original document. The Audit Log of the new document will have one entry describing when the document was created.

Option 2

1. From the stand alone safety document's **File** menu, select **Copy As...**.
2. Select a document type from the list.

3. Click **Create a Copy**. A new safety document is created. This new document will have the same list of devices as the original document. The Audit Log of the new document will have one entry describing when the document was created.

Create a Safety Document in Study Mode

1. From the New Safety Document dialog box, select a safety document type and click **Create**. The new document is created and by default goes into Real-Time mode.
2. Click the **Study Mode** button ( ).
3. Verify that Control Tool action recording is on and Viewer device selection recording is off.
4. Open the Viewer in Study Mode.
5. Add appropriate tags and grounds to devices. As the actions are recorded by the safety document, the devices show up in the Tag Points and Grounds lists.
6. Once all of the tags and grounds have been applied, issue the safety document, and release it to test in Study mode.
7. Reset the study session from the safety document.
8. Select the Tag Points and place the tag points in the model. This can be done by selecting the device and clicking the **Place Condition** button ( ).
9. Select the Grounds and place the grounds to the model. This can be done by selecting the device and clicking the **Place Condition** button ( ).
10. Click the **Focus** button ( ). The Viewer will display the appropriate conditions on the devices.
11. Issue the safety document. The conditions displayed in the Viewer will change to indicate that they are under the control of a safety document. This is indicated by displaying a padlock symbol on top of the condition symbol in the Viewer. The status of the document is updated in the status bar, which is found at the bottom of the document.

Associate an Existing Place Tag Action to a Safety Document

1. With no switching sheet or safety document in record mode, find a device that can have a HOLD condition.
2. Double-click the device to launch the Control Tool.
3. Select **Place Hold Tag** from the **Tag...** menu's **Hold Tags** submenu. A Hold Tag step is recorded into the Miscellaneous Log.
4. Create a HOLD safety document.
5. Load the Miscellaneous Log and refresh the list so that the Place Hold Tag step is displayed.
6. Select the Place Hold Tag step. Click the **Cut Step** button ( ) to cut the step.
7. Go back to the newly created Hold Safety document and click the Paste button ( ). The device associated to the Place Hold Tag step is displayed in the safety document's Tag Points list. The safety document can now be issued.

Note: If you attempt to add a step action association that is not valid for the safety document type, an error message will be displayed. For example, you would get an error if you attempted to add a step action for a Place Hold Tag into a Clearance document.

Chapter 12

Power Flow

This chapter covers the following topics:

- Introduction
- Power Flow Solution Types and Frequency
- Viewer Power Flow Information Visualization
- Seasonal and Temperature Based Limits
- Disconnected Distributed Energy Resources
- Power Flow Results with Predicted Outages
- Real-Time Power Flow Updates
- Viewing Power Flow Results in Real Time
- Viewing Power Flow Results in Study Mode
- Using Power Flow with Look Ahead
- Power Flow Solutions Details
- Using the Conductor Impedance Mismatch Tool

Introduction

Oracle Utilities Network Management System Power Flow enables engineering analysis of the electrical distribution system for use in the operations and control center rather than for design or planning purposes. The analysis allows you to assess the equipment loading and feeder voltage profiles for selected portions of the electrical network. In addition, you can review overload, voltage, and fault information.

Power Flow functionality allows you to view the results of the power flow solution, enter and evaluate solution options, and modify execution parameters.

> **Note:** Power Flow solutions may be returned as 'Inconclusive' when there are errors in the data model. That section of the network is disabled for Power Flow solutions until the island is re-enabled manually or the model is updated. See Chapter 17, Feeder Load Management for more information on feeder status and re-enabling a non-converged island.

Power Flow Solution Types and Frequency

The type of solution performed by Power Flow analysis is dependent upon the available data and a feeder's assigned power flow analysis mode (kVA or full power flow solutions). A kVA solution will likely solve faster than a power flow solution, but will not show any voltage drop/rise or voltage violation information.

Notes:

Data requirements for kVA solutions are far less rigorous and may be advantageous for customers starting to implement Oracle Utilities Network Management System DMS applications.

Customers have the ability to configure different solution types for the feeders within their distribution network. The feeder solution type may be changed using the PF Mode in the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32).

If desired customers can also set the solution type to Disabled which will force PFService to not solve that particular area. Generally Disabled is reserved for areas of the model that do not yet have data for the kVA or Power Flow based solution.

The Power Flow analysis determines whether a solution should be done in kVA mode or power flow mode. If sections of network that are configured for kVA solutions are tied to sections of network that are configured for power flow solutions, the resulting solution will default to using the kVA analysis. The overall look and feel of the user interfaces will be kept the same depending on if the solution was solved using kVA or power flow analysis; in some situations fields may display **N/A** as they may not be applicable while in kVA mode. For example, power flow will not be able to calculate power transformer tap positions or the status of voltage regulated capacitor banks as voltage drop/rise will not be calculated.

Note: When the feeder solution type configuration is transitioned from kVA mode to Power Flow mode or vice versa, it may take some time before all solutions within FLM are fully transitioned from one solution type to the other. All hourly forecasts should be completed within 24 hours, but it may take up to 6 days for all daily peak forecasts to update if no topology changes occur or an administrative user does not force a full re-forecast.

The frequency at which power flow solutions are recalculated is dependent upon which DMS applications have been implemented. If only Power Flow has been implemented, the real-time solution will be resolved cyclically every 15 minutes or when triggered by an electric distribution system topology change and no forecasting will be conducted. Alternatively, if Feeder Load Management (FLM) is implemented in conjunction with Power Flow, the real-time solution will be solved cyclically every 15 minutes, hourly forecasting will be conducted at the top of each hour, and a real-time and hourly forecasting resolve will be triggered immediately after a topology change. Consequently, by implementing FLM, a customer is able to gain forecasting ability that assists with identifying potential issues. See Chapter 17, Feeder Load Management for more information on when FLM performs solutions.

Note: The cycle time for FLM is set by the **CYCLE_TIME** SRS rule Administrators may edit the value in the Configuration Assistant. Select the rule from the **Feeder Load Management Rules** navigation tree, which is in the **DMS Application rules** tree (see **Using the Event**

Management Rules Tab on page 24-16). The default cycle time, set in Rule Value 2, is 900 seconds.

Viewer Power Flow Information Visualization

In addition to the standard feeder and phase views, the Viewer provides options for visualizing the power flow information. The Viewer Legend, which is opened from the Help menu, displays legend information based on the view selected in the Viewer's **Options** menu.

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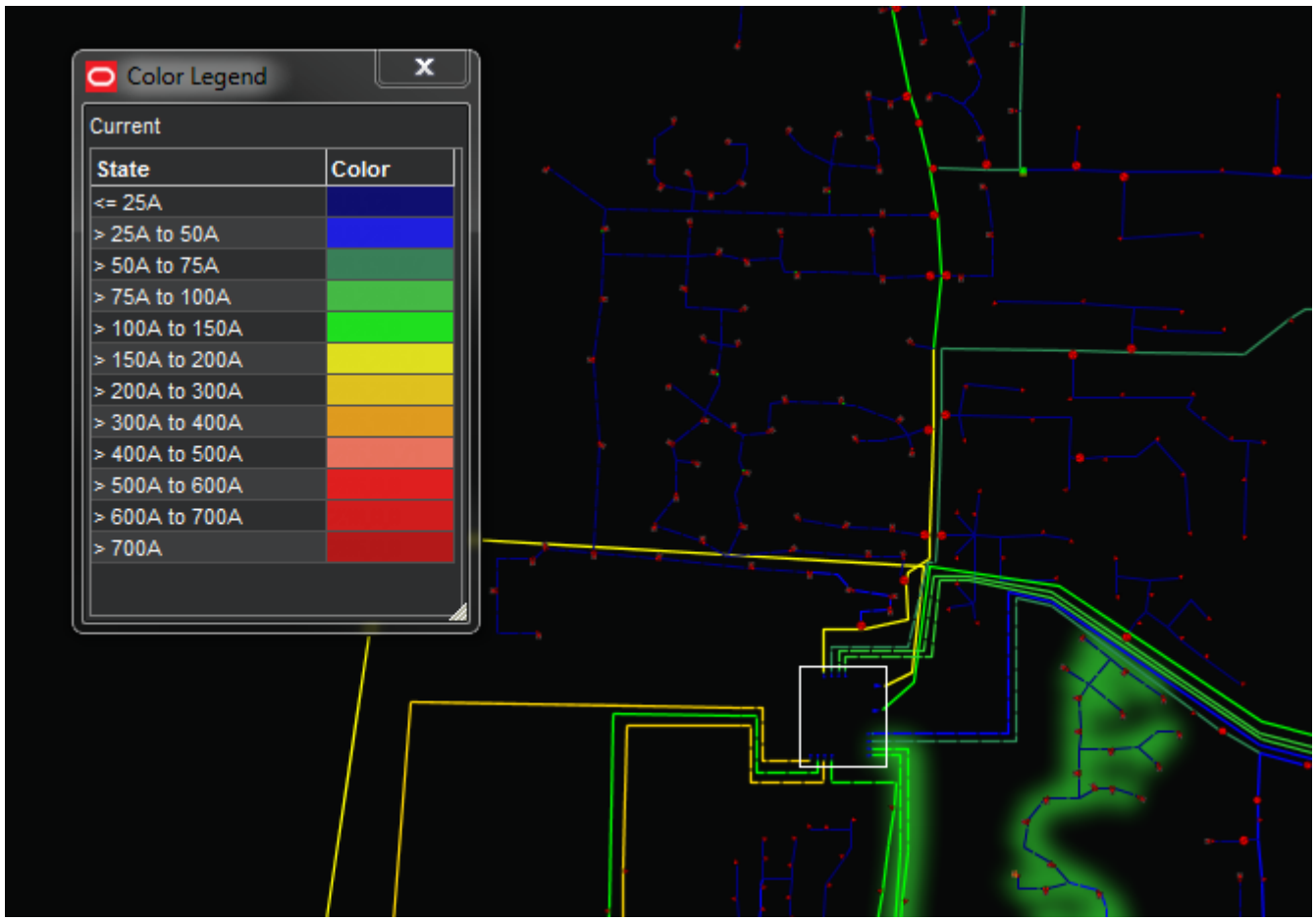
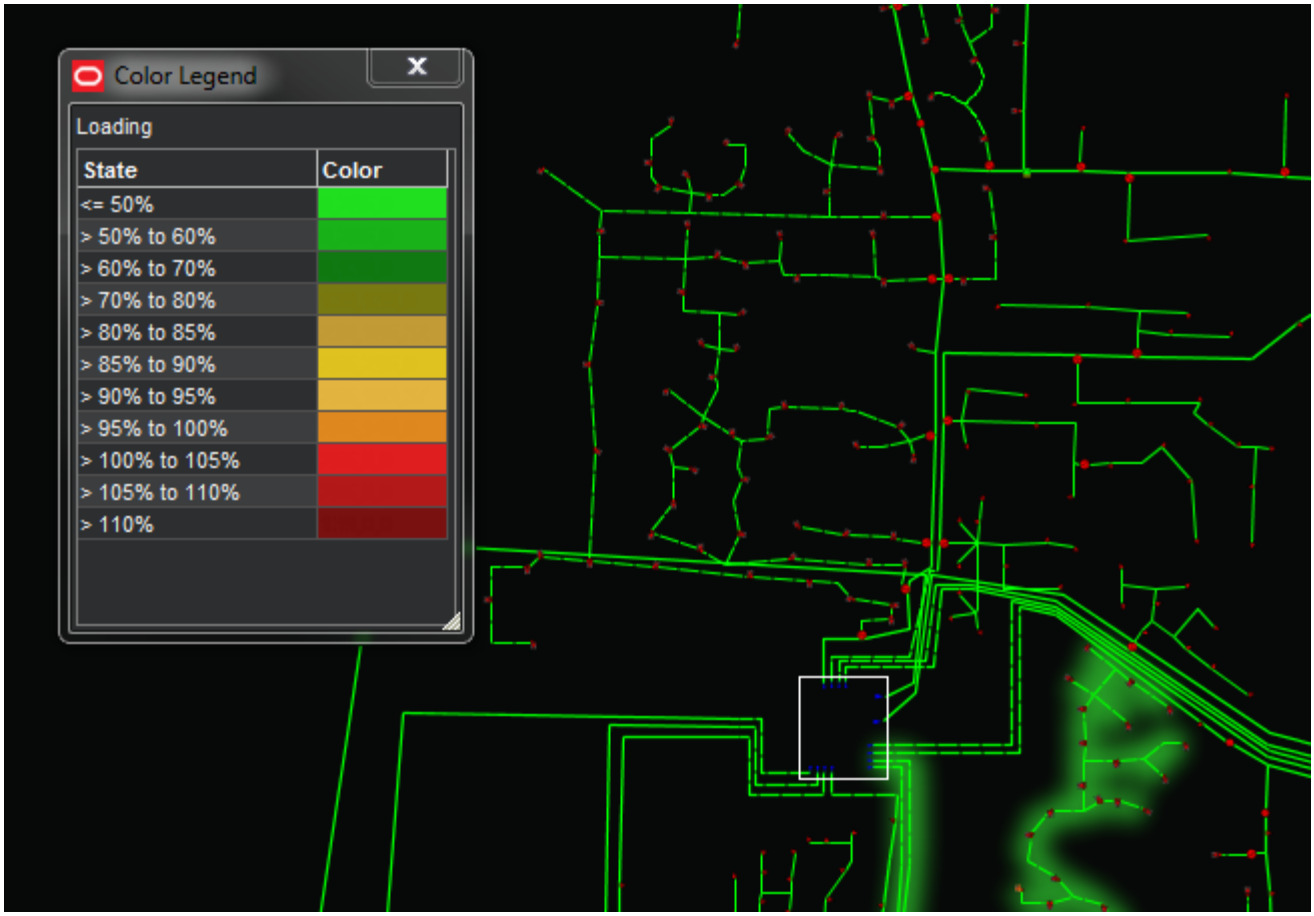
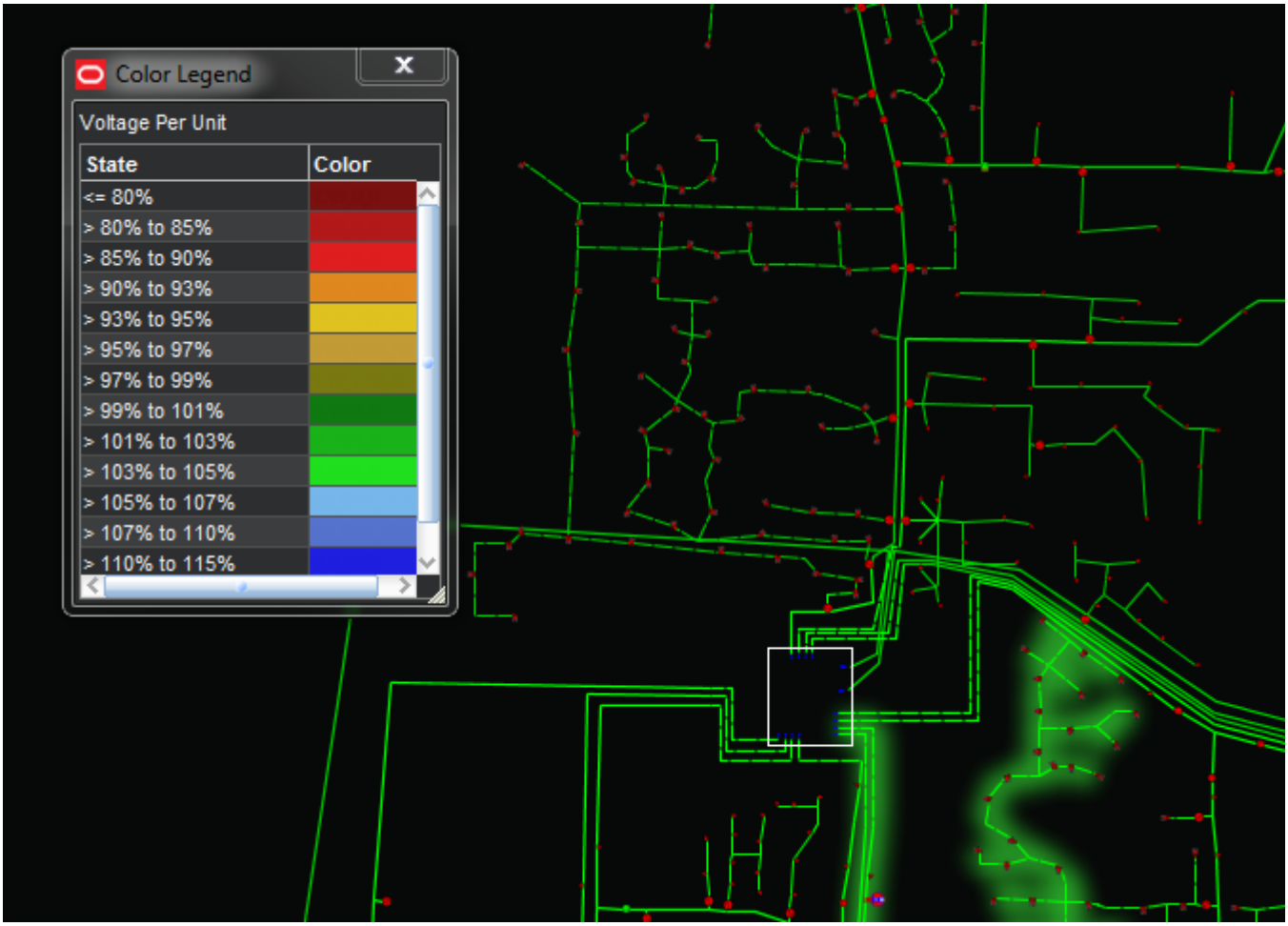


Currents: the current range



Loading: the per unit current range.

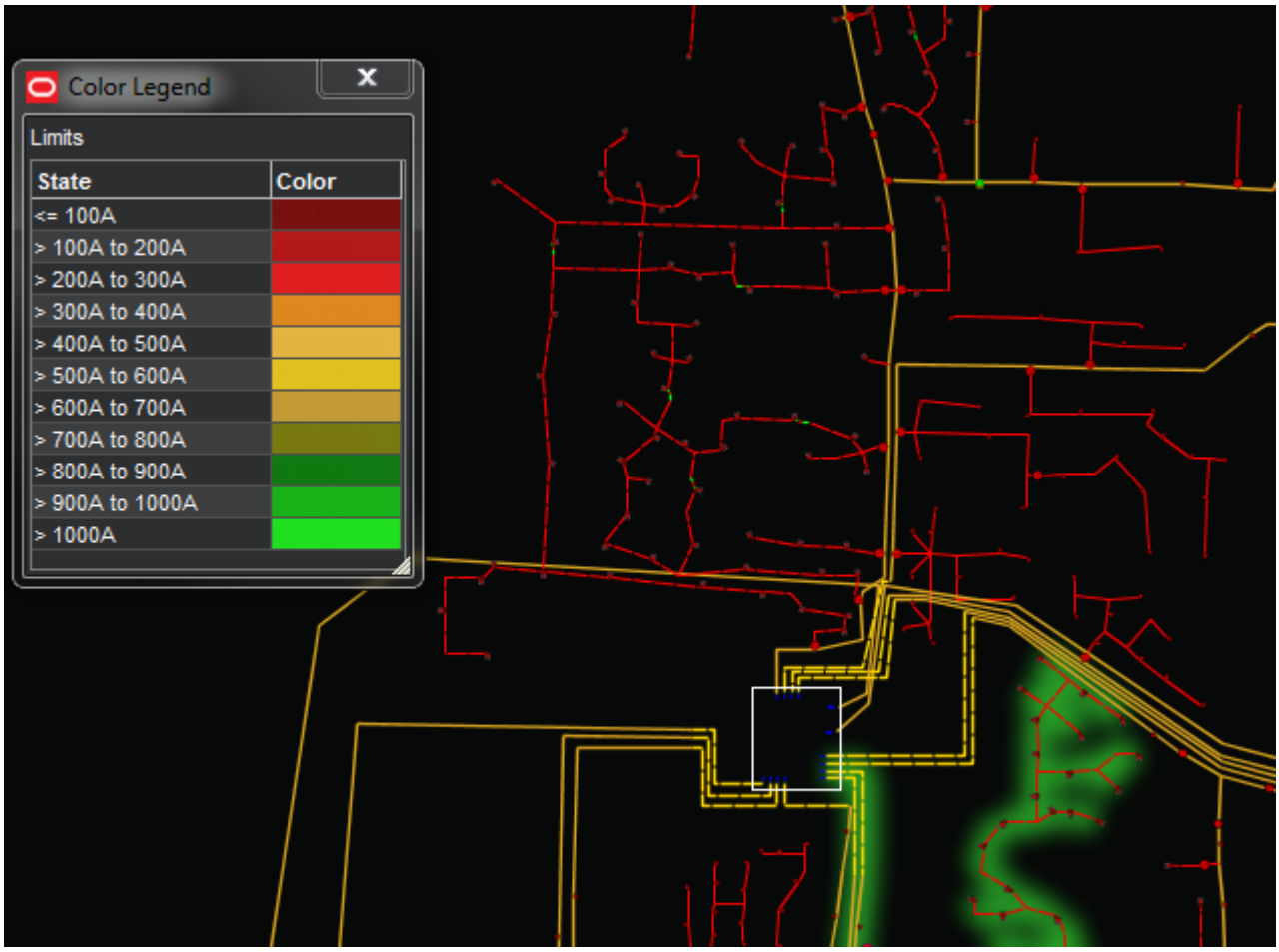


Voltage Per Unit: the per unit voltage range.

Note: If a feeder is solved in kVA mode, then the voltage will be constant.

Nominal Voltages: the nominal voltage range.

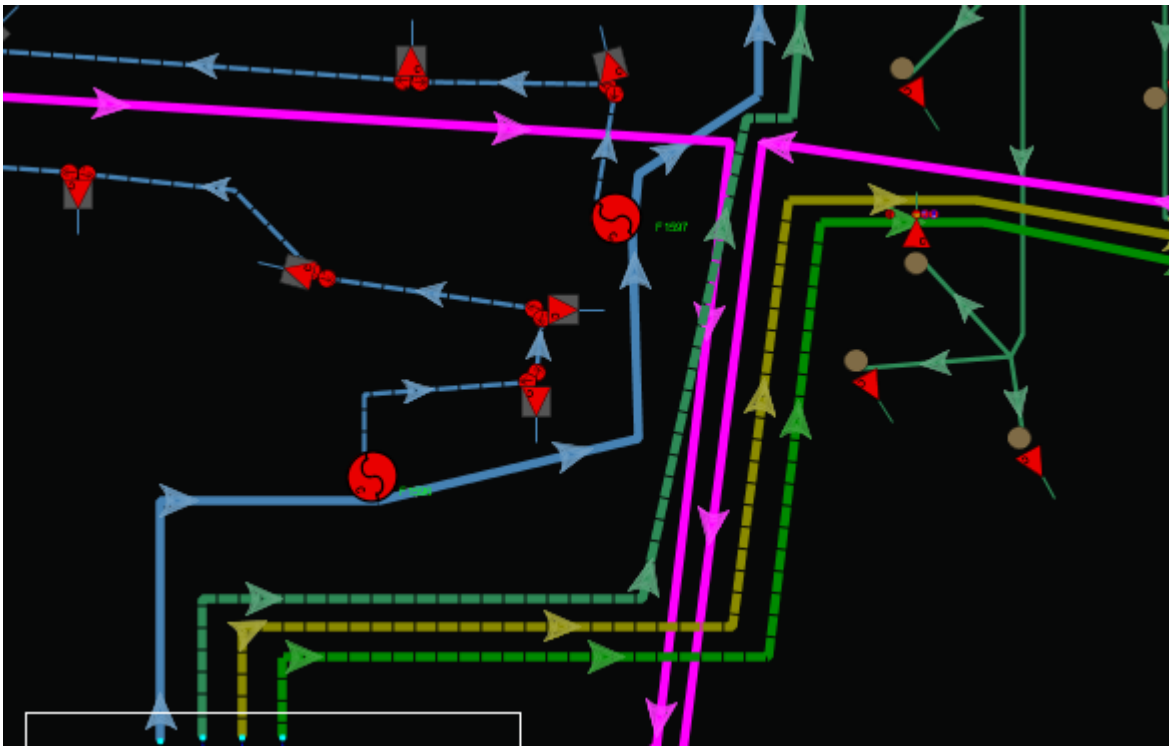
Note: If an area of the model is set as Power Flow Disabled the voltage configured within database table NETWORK_COMPONENTS will be utilized instead.



Limits: conductor Amp limits.

Flow Direction

The Viewer will render any of the view options with flow direction by selecting Show Flow Direction from the Viewer's **Options** menu (Shift-D). The example below shows Feeder with flow direction enabled..



While the power flow is solving, or when a solution has failed, hash marks are displayed instead of arrows. Because this is a power flow solution, looped and parallel areas can still display flow direction arrows. These arrows will point to the equilibrium spot. If power flow is not licensed, the arrows will show a simpler topological flow that cannot detect an equilibrium point.

Line Catalog Information

The Line Catalog Information dialog box displays power flow line catalog information for a conductor selected in the Viewer. To see the Line Catalog Information, select a conductor, launch its Control Tool, and click the **Line Catalog Info...** button.

The dialog box has two panes containing the following information.

Top Pane

The top pane displays the following information:

- **Class:** The device class description.
- **Name:** The conductor ID.
- **Voltage:** The nominal conductor voltage (line to line).
- **Length:** The conductor length.

Lower Pane

The lower pane displays information related to the power flow line catalog:

- **Conductor Catalog:** The identifier for a conductor impedance catalog defined within the Oracle Power Flow Engineering Data Workbook.
- **Data Source:** The method in which the data was provided within the Oracle Power Flow Engineering Data Workbook. The possible methods for providing data are:
  - Construction Parameters
  - Phase Impedance
  - Sequence Impedance

  Note: If the Construction Parameter method was used for a particular catalog, four additional fields will show up to display the different phase and neutral conductors that make up the catalog.
- **R1:** The positive sequence resistance of the conductor catalog.
- **X1:** The positive sequence reactance of the conductor catalog.
- **R0:** The zero sequence resistance of the conductor catalog.
- X0: The zero sequence reactance of the conductor catalog.
- **Ph A Line Catalog:** The conductor type used for phase A (only displayed if the Data Source was Construction Parameters).
- **Ph B Line Catalog:** The conductor type used for phase B (only displayed if the Data Source was Construction Parameters).
- **Ph C Line Catalog:** The conductor type used for phase C (only displayed if the Data Source was Construction Parameters).
- **Neutral Catalog:** The conductor type for the neutral (only displayed if the Data Source was Construction Parameters).
- **Limits:** Will show either the temperature or seasonal based limits for the conductor depending on how the project has setup the limit configuration.
- **<Season or Temp Band> Normal Limit:** The normal ampere capacity limit for the conductor for the specified season or temperature band.

  Note: *Ampere Capacity* may also be referred to as *ampacity*.
- **<Season or Temp Band> Emergency Short Limit:** The short term emergency limit for the conductor for the specified season or temperature band.
- **<Season or Temp Band> Emergency Long Limit:** The long term emergency limit for the conductor for the specified season or temperature band.

  Note: The number of configured seasons or temperature bands can change based on project configuration (for example, yearly ratings, four seasons, ten temperature bands, and so on).

Seasonal and Temperature Based Limits

The power flow analysis can be configured to work with seasonal or temperature based limits when specifying ratings for power transformers and conductors. For these types of devices, the upper limit that the device can be pushed to is heavily dependent on the ambient air temperature (in general, these devices can be pushed harder when the temperature is cooler since natural cooling can occur). Both the seasonal and temperature based approaches represent a mechanism to specify what the ambient air temperature is doing — with the temperature based approach providing much more possibility for granularity. Both approaches are global in nature so a project cannot specify one type of configuration for one area of the model and another approach for a different area. Any ratings provided for switches will have the standard concept of normal, short term emergency, and long term emergency limits.

> **Note:** This configuration can be changed (in the Configuration Assistant) by setting the **USE_TEMP_LIMITS** SRS Rule. Setting the rule to **`yes`** enables temperature based limits; setting the rule to **`no`** enables seasonal based limits. Depending on the rule configuration, various user interface elements will change to show the corresponding options.

Seasonal Based Limits

For seasonal based limits, projects will pre-configure a set of date ranges that define seasons applicable to the geographic region. The quantity of seasons and dates associated with each season is configurable so, for example, if only two seasons were needed, a project could set up **`Winter`** and **`Summer`** seasons. When providing limit data to use for conductors and power transformers, values need be provided for each season in the Power Flow Engineering Data workbook. In the real-time power flow analysis, the date for which the solution is conducted will determine which set of seasonal limits is used; for example, if a date falls within the `Winter` season, all seasonal limits associated with `Winter` would be used in the analysis. While running power flow analysis in study mode, you have the option to choose whichever season you wish to use for the *what if* analysis.

One of the shortcomings of the seasonal method (versus the temperature based approach) is when there are areas in the network that experience different weather conditions. For example, some areas might be experiencing weather typical of summer while others areas are experiencing weather typical of fall; in this scenario, the analysis would use the season that includes the date despite the different conditions.

Temperature Based Limits

For temperature based limits, transformers and conductors can be grouped to the same set of *Weather Zones* that are used for driving Distributed Energy Resource forecasts. Each of these weather zones will have a temperature forecast that is provided via a real-time weather feed. Pre-defined limits will be provided in the Power Flow Engineering Data workbook for various temperature bands and the weather forecast will drive which of these is applied for the real-time loading and future forecasts. So, for example, the configuration may be set up such that conductors and transformers will have a limit defined for each 20°F range of temperature. The limit used for each power flow solution will be based on the forecast temperature for the date and time the solution is for and weather zone the device is in. Therefore, while looking at forecast power flow solutions

for a device, it may be possible to see the upper limit changing as the temperature changes throughout the day. This is the one big differentiator between seasonal based limits and temperature based limits: with the temperature based limits, the limit used has the possibility to change hour by hour as temperature changes, whereas with seasonal limits, the same limit will be used for a larger date range.

> **Note:** For SCADA telemetered power transformers, it is possible to configure a temperature value for the device. In this situation, the analysis will use the SCADA provided temperature instead of the forecast temperature for the weather zone that the device is a part of for choosing the limit in the real-time solution. For all forecast solutions, the weather feed temperature will still be used for choosing the limit.

Disconnected Distributed Energy Resources

When a feeder is de-energized or experiences a momentary outage, any connected DERs are required to comply with IEEE-1547 disconnect rules. If the DER is not capable of operating in island mode, it must, for safety reasons, disconnect and stay off-line until voltage and frequency have been restored. Once the DER is re-energized it must remain disconnected for a period of time (typically 5 minutes) before re-connecting to the network. This behavior is modeled in the Power Flow applications so that correct voltage and load can be determined.

When a DER unit is in this disconnected state, a condition is applied to the device to alert operators that the condition is temporary.

Power Flow Results with Predicted Outages

Power flow analysis supports treating predicted outage devices as being open from the context of power flow results (when enabled by setting an SRS rule). If the functionality is enabled, any device that has a PDO or PSDO will be considered open within the power flow solutions; if a user were to look at the solution results below an outage device, they would see zero flow or voltage. If the functionality is disabled, any predicted outage device will still be treated as closed and show power flow through it.

This functionality, if enabled, is only available in real-time mode since it could be confusing to users to enable it in study mode even if they are using real-time topology. While in study mode, there is no context as to which devices have predicted outages so a user would need to keep switching back and forth to determine this. When a predicted outage event is received, it will not force an immediate resolve of the solution; rather, it will be handled much like an analog measurement and get reflected into the solution during the next real-time solve cycle.

> **Note:** This functionality is set using the **CONSIDER_OUTAGE_EVENTS** rule. Administrative users can view or change this setting on the Configuration Assistant Event Management Rules tab (see **Using the Event Management Rules Tab** on page 24-16 for details).

Real-Time Power Flow Updates

When a switching operation occurs in the system, it may take a few seconds before analog SCADA measurements update to reflect the new configuration. For this reason, the real-time power flow will not update instantaneously after a topology change, but will wait a configured number of seconds (the default is 30) before a resolve is triggered. By then, it is assumed that the system measurements are again stable. Clicking on the power flow results during the delay will result in a Power Flow Results Pending message being displayed.

> **Note**: The delay period is set in the SCADA_DELAY_TIME rule. Administrative users can view or change this setting on the Configuration Assistant Event Management Rules tab (see **Using the Event Management Rules Tab** on page 24-16 for details).

Viewing Power Flow Results in Real Time

The **Viewer's Device Details Power Flow Results** tab displays power flow calculation information for *energized devices*. See **Displaying Device Details** on page 2-58 for information on accessing and using Device Details.

> **Note:** For information regarding what is displayed for de-energized devices, see **Understanding Device Details for De-Energized Devices** on page 12-15).

As an object is selected in the **Viewer**, the **Power Flow Results** tab updates with the calculated feeder voltages and equipment flows. The lower right corner of the **Power Flow Results** tab will display the time when the last solution was solved.

To view the Power Flow results for a device in real-time, follow these steps:

1. Start the **Viewer**. If the **Viewer** is in Study Mode, click the **Real-Time** ( ) button to set the mode to Real-Time.
2. Click the **Viewer's Device Details** button ( ) to enable **Device Details**.
3. Select a device.
4. Select the **Power Flow Results** tab to display the latest power flow results for the device.

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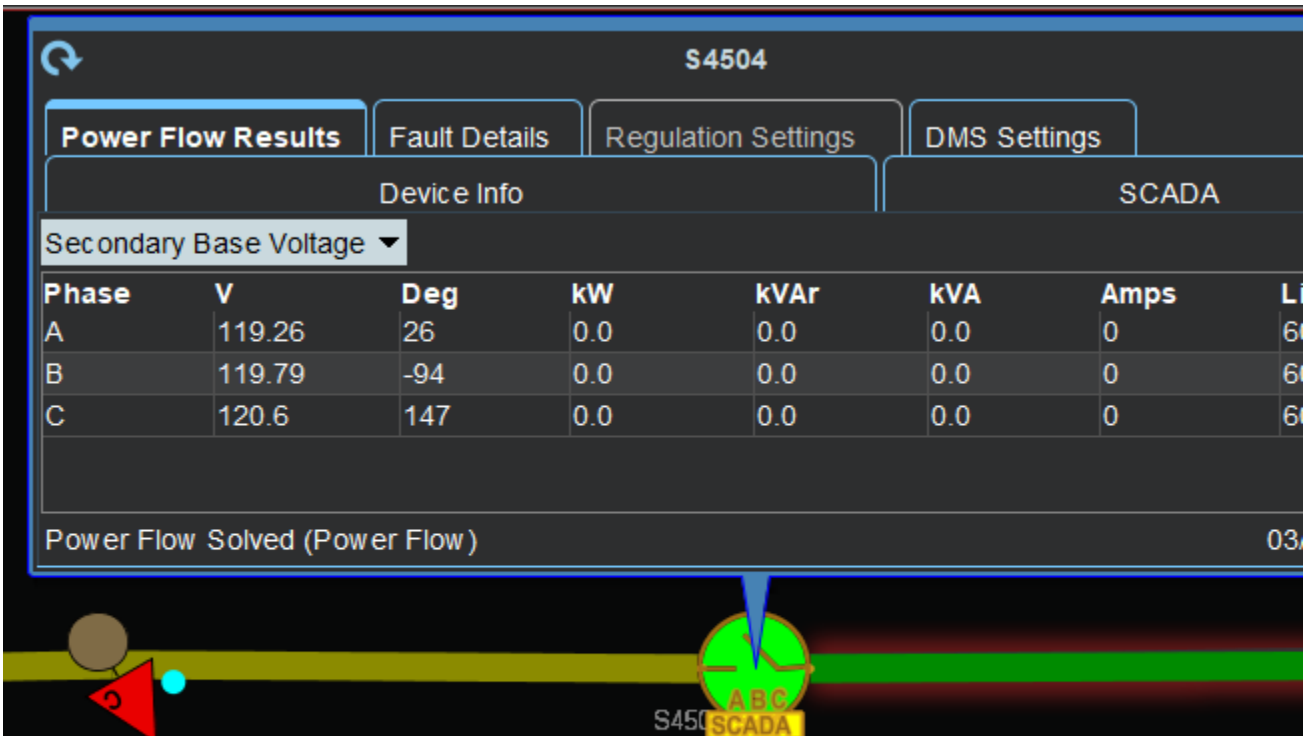


Note: To view more information about the power flow conditions, click the **Power Flow Solutions Details** button ( ), which will open the Feeder Load Management Feeder Errors, Warnings, and Details dialog box.

Understanding the Device Details Power Flow Results Data Table

The **Device Details Power Flow Results** tab displays power flow solutions in a tabular format. The date and time the last power flow solution was conducted for the selected device appears in the bottom right corner of the balloon dialog box.

- The Voltage Display Type drop-down list allows you to select the power flow calculation is displayed. You can change this to any of the following:
  - Secondary Base Voltage
  - Nominal Base Voltage
  - Voltage Percent
  - Line to Line Voltage

  Note: When using **Secondary Base Voltage** or **Voltage Percent** while viewing load voltages, the true secondary side voltage will be displayed factoring in the secondary impedance drop for the device.
- **Table Columns**
  - The **Phase** column displays the device phase.
  - The **Deg** column displays the voltage phase shift (angle) in degrees.
  - The **kV** column contains calculated voltage in the units selected in the **Voltage Display Type**. There are multiple options available for Voltage Display Type. If you have selected a multi-phase device, options for **Line Voltage**, **Phase Voltage**, **Voltage Percent**, and **Secondary Voltage** will be available. On multi-phase devices, the **Secondary Voltage** and **Voltage Percent** will show voltage magnitude and phase angle in line to line representation. When values are represented in line to line representation both voltage magnitude and angle values will have the phases involved appended to it. If you have selected a single phase device, the **Voltage Display Type** for **Line Voltage** will be removed since a second phase does not exist to do a proper line to line voltage calculation. If you have selected a two phase Delta load, a single row showing both phases involved will be displayed.

  Note: If a feeder is configured for kVA solutions, the voltage on the feeder will be constant and not reflect the true drop/rise occurring in the field.
  - The **kW** column contains the calculated voltage in the units selected above.
  - The **kVAr** column contains the phase reactive power flow.
  - The **Amps** column contains the phase current.
  - The **Limit** column contains the phase limit in either Amps, kVAr, or kVA depending on the device type:
    - Lines, Switches (Amps)
    - Capacitors (kVAr)
    - Transformers, Distributed Generation Devices, Loads (kVA)

  In **Study Mode**, the **Power Flow Results** tab also displays a **Refresh** button. Clicking this button displays the Study Session Parameters window so you can change the Power Flow Options**.**

Understanding Power Flow Results Table Data Indicators

Voltage and current violations are highlighted in red. Voltage and current warnings are highlighted in yellow. Amps for backfeeds are highlighted gray.

Understanding Device Details for De-Energized Devices

If a selected device is de-energized, the **Power Flow Results** tab is populated with a new column, PICKUP AMPS, and shows the load downstream of the selected network component from the PO or RO. The other Power Flow values (for example, Voltage, Deg, and so forth) are replaced with 0. The Power Flow status message is replaced with "De-energized device (N/A)."

If the Pickup Amps are not calculated for the selected de-energized network component, then the **Calculate Pickup Amps** button is enabled on the power flow results tab. When you click the **Calculate Pickup Amps** button, Power Flow will solve for the pickup amps (load) downstream of the selected device, assuming the outage device (predicted or real) had been closed.

Power Flow Status Messages

Power Flow status messages are provided to better alert you of the quality of the power flow solution being generated. They are displayed at the bottom of the Power Flow Results tab along with the date and time of the latest result.

> **Note:** The power flow analysis solution type (that is, kVA or Power Flow) is appended to the end of the status message. If an area of the model is set as disabled, a message of "Power Flow Disabled" will be displayed.

Status messages for the NMS product configuration:

- **Power Flow Solution Pending** indicates that the power flow solutions are currently paused due to recent system topology changes and results will not be available until the configured delay has ended.
- **Power Flow Solved** indicates that the power flow calculations have completed successfully and the results are valid.
- **Inconclusive Power Flow Solution** indicates that Power Flow cannot find a stable solution since each iteration of the power flow algorithm yields a changing result.
- **Power Flow Not Solved - Suspect SCADA** data indicates that power flow solution failed to solve successfully due to SCADA data irregularities. See Chapter 17, Feeder Load Management for details on identifying SCADA data irregularities.
- **Power Flow Not Solved - Data Model Error** indicates there is an issue with some part of the data model that will not allow a reasonable solution to the power flow calculation.

> **Note:** If a selected device is de-energized, the **Power Flow Results** tab is populated with the PICKUP AMPS column, and shows the load downstream of the selected network component from the PO or RO. The other Power Flow values (for example, Voltage, Deg, and so forth) are replaced with 0. The Power Flow status message is replaced with "De-energized device (N/A)."

Viewing Power Flow Results in Study Mode

Power Flow results are calculated each time you display the Device Details Power Flow Results. To view Power Flow results for a device in study mode, follow these steps:

1. Start the Viewer and enable Device Details.
2. Set the Viewer to Study Mode. (When you change to Study Mode, the system prompts you to set the Study Session Parameters, as described in the next section.)
3. Select the device for which you want to view Power Flow results. (Click the left mouse button to select.) The Device Details dialog box appears.
4. Click the Power Flow Results tab. The Power Flow Results tab is populated with the calculated results.
5. Click the Power Flow Options button to view or modify the Study Session Parameters.

Understanding the Power Flow Study Mode Load Scenario

The **Power Flow Study Mode Load Scenario** tool allows you to set the parameters for network conditions that the power flow calculations will be based upon.

Load Profile

Allows you to setup the load and generation profile curves to be used for the study session.

- The **Real-Time** option will utilize the current (real-time) loading and generation values.
- The **Specific Hour** option will utilize the forecast loading and generation values for the selected date and time.
- The **Specific Period** option allows you to define a unique combination of load and generation profiles for a particular day type, hour of day, temperature, and weather conditions.

These parameters allow you to simulate a variety of scenarios.

For the **Specific Period** option, the following information is used:

- **Hour:** select the hour to use for calculating results (0-23, Daily Peak).
- **Day:** select the type of day. In the product configuration, the **Day** options are Weekday, Weekend, and Seasonal Peak with capacitors on or off.

Additional options allow you to select generation schedules for various distributed generation units based on the fuel that supplies the unit. The product configuration has the following options:

- **Temp (F):** Chose the temperature range to use for adjusting load conditions or temperature based limits. For each real-time based day type (weekday, weekend), multiple sub profiles exist representing different temperatures bands to characterize how the load behaves on that type of day for a range of temperature (for example, 80°F - 90°F). Using temperature as a parameter allows better simulation results to be achieved. For example, a weekday at 60°F versus a weekday at 100°F will have far different loading conditions. For temperature

based limits, this parameter will drive the limits used for power transformers and conductors. Each of these device types will have predefined limits for a temperature band and this value will drive the limit used in the analysis.

Note: The temperature parameter will be grayed out if both Temperature Based Profiles and Temperature Based Limits have been turned off. These can be set using SRS rules **`USE_TEMP_PROFILES`** and **`USE_TEMP_LMITS`**, respectively. If temperature based profiles are turned off, it will be expected that a customer will provide a single profile for each load that will be used for all ranges of temperatures.

- **Wind Speed (mph):** select the wind speed available for wind power sources.
- **Cloud Cover:** select the amount of cloud cover (for example, Clear, Mostly Clear, Partly Cloudy, Mostly Cloudy, Cloudy)
- **Residential Battery:** select the profile for battery charge/discharge cycles (for example, On, Off).
- **Residential Fuel:** select the profile for fossil fuel use (for example, On, Off).
- **Utility Battery:** select the profile for utility scale battery charge/discharge cycles (for example, On, Off).
- **Utility Fuel:** select the profile for fossil fuel based units (for example, 25%, 50%, 75%, 100%).
- **DR:** select the profile for demand response objects (for example, On, Off).

Scaling Factor

The **Scaling Factor** is a number that modifies the loading conditions for the selected profile. Typically a value of 1.0 is used; if you want to study the impact of increased or decreased load, enter values greater than or less than 1.0, respectively.

Cold Load Pickup

Allows you to determine if de-energized loads should be treated as Cold Loads.

Limits

- **Limit Type** is either **Normal**, **Emergency (Long Term)**, or **Emergency (Short Term)**.
- **Season** allows you to select the simulation season.
  - **Summer**
  - **Fall**
  - **Winter**
  - **Spring**

  Note: The season drop-down list will only be displayed if seasonal limits have been configured. If a project is using temperature based device limits, this option will not be available.
- **High Voltage Limit** is the high voltage to use for reporting limit violations.
- **Low Voltage Limit** is the low voltage limit to use.

To request a Power Flow solution using the entered values , click OK. When the system is finished calculating the results, the Power Flow Study Mode Load Scenario window will close and the results will be displayed in the Power Flow Results tab on the balloon details dialog box.

Note: Values are not saved when you apply them. The next time you open this dialog box, the last saved values (rather than the last applied values) will be displayed. If no values were previously saved, real-time values will be used.

- To reset to previous values, click Reset. If you want to request a solution for the default values, click OK.
- To close the dialog box without any action, click Cancel.

Using Power Flow with Look Ahead

During switching operations, the Look Ahead window allows you to preview the results of switching actions before you perform them. Look Ahead displays information including customers dropped/picked up, critical customers dropped/picked up, and load kVA.

With Power Flow Extensions, the Look Ahead window also includes information about the power flow solution, including the voltage, angle, and current changes that will result from a switching operation. The number of voltage and conductor violations is displayed at the top of the Look Ahead.

When you select an operation from the Control Tool, you can click the Run Power Flow button on the Look Ahead window to see what the effect would be if you completed the operation. If the device's island is configured to solve using kVA mode, the Power Flow Results tab will display **(kVA)**; if it is configured to solve in Power Flow mode, it will display **(Power Flow)**.

The results are displayed at the top of the Look Ahead window and any violations resulting from the action are displayed in the Violations Tab tab. For information about the Look Ahead window, see **Using the Look Ahead Dialog Box** on page 2-122.

Power Flow Solutions Details

Power Flow solutions details feature allow users to request and review power flow solution details to identify areas of the model with data problems. Non-administrative users have access to Power Flow Solution Details for all real-time based power flow solutions, which are auto-generated; administrative users also have access to real-time Power Flow Solution Details and also have the ability to force generation of details for forecast and study mode power flow solutions.

The solution details page is available from the Viewer's Device Details Power Flow Results tab, from the Feeder Load Management Feeder Load Overview table, and from the Feeder Load Summary.

Viewing Power Flow Solution Details from the Viewer

1. Start the Viewer.

2. Click the Device Details button ( ) to enable Device Details.
3. Click the device.
4. Click the P**ower Flow Results** tab, if not active.

   The Power Flow Results tab is populated with the calculated results.

5. Click the **Feeder Errors, Warnings, and Details** button ( ) to open the Feeder Errors, Warnings, and Details dialog box.
6. Select the **Solution Details** tab.

   Note: When opened through Feeder Load Management, Power Flow Solution Details opens in a combined FLM **Feeder Errors, Warnings, and Details** dialog box, which contains two tabs; one tab is for solution details and the other for errors and warnings. Please see **Feeder Errors and Warnings** on page 17-10 for more information on the **Errors and Warnings** tab.

Viewing Power Flow Solution Details from the Feeder Load Management Tool

1. Open Feeder Load Management.
2. Select a row in the Feeder Load Overview table.
3. Select **Show Errors and Statistics...** from either the Actions menu or the right-click option menu.
4. When the dialog box opens, select the **Solution Details** tab.

   Note: When opened through Feeder Load Management, Power Flow Solution Details opens in a combined **FLM Feeder Errors, Warnings, and Details** dialog box, which contains two tabs; the first tab displays errors and warnings and the second tab displays solution details. Please see **Feeder Errors and Warnings** on page 17-10 for more information on the **Errors and Warnings** tab.

Viewing Power Flow Solution Details from the Feeder Load Summary Tool

1. Open Feeder Load Summary
2. Select a row in the summary table.
3. Select **Show Errors and Statistics...** from either the Actions menu or the right-click option menu
4. When the dialog box opens, select the Solution Details tab.

   Note: When opened through Feeder Load Summary, Power Flow Solution Details opens in a combined **FLM Feeder Errors, Warnings, and Details** dialog box, which contains two tabs; the first tab displays errors and warnings and the second tab displays solution details. Please see **Feeder Errors and Warnings** on page 17-10 for more information on the **Errors and Warnings** tab.

Using Power Flow Solution Details Window

The solution page includes:

- Title with load scenario, time for the solution, and starting device when the request was sent from the Viewer or starting feeder when the request was sent from FLM. The title also includes the solution status device when the request was sent from the Viewer.
- SCADA re-distributions descriptions.
- Power Flow Service iteration descriptions for each SCADA iteration with a list of shunts with step changes and a list of distributed generators with output changes. If at least one of the lists is not empty, the Power Flow Service iteration will be displayed as a hyperlink to the iteration details page.
- Hyperlinks to the Unbalanced Power Flow iterations for each PFService iteration with lists of devices with largest voltage mismatches (up to 10 devices) and lists of transformers with tap moves. Click an iteration link to navigate to the iteration page.
- All devices are displayed as hyperlinks, which focus the Viewer on the device.
- All iterations are listed in reverse chronological order, with the most recent at the top.

Click the **Back** button to navigate back to the summary page.

Using the Conductor Impedance Mismatch Tool

The Conductor Impedance Mismatch Tool performs an analysis to find sections of the network where conductor impedances look incorrect. For example, if a circuit backbone was primarily large conductors with a very small conductor in the middle, this would most likely be representative of a data error in the attribution of conductor sizing.

The tool works in the background and it is recommended to run this tool during the NMS off-peak working hours to minimize the impact on system performance. Also, the analysis runtime should be chosen such that it stops before NMS peak hours.

Conductor Impedance Mismatch Tool Window

Conductor impedance mismatch tool window displays the report of data anomalies within the Power Flow data model and provides the interface to start and stop the conductor impedance mismatch analysis.

Menu and Toolbar Options

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the Print dialog box, which allows to print the report.	
Exit	Closes the Conductor Impedance Mismatch Tool window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Run Analysis...	Opens the Feeder Data Analysis dialog box, which allows you to input the analysis runtime in minutes.	
Stop Analysis...	Stops the feeder data analysis if it has not already finished and displays the report in the table.	
View...	Displays the selected conductor in the viewer.	
Copy	Copies selected rows.	
Purge Analysis Results...	Opens a confirmation dialog box that allows you to purge old analysis results.	

Help Menu

Menu Option	Description	Toolbar Icon
Conductor Impedance Mismatch Analysis Tool Help	Opens the online help system to the Conductor Impedance Mismatch Tool help content.	--

Understanding the Conductor Impedance Mismatch Tool Filter Pane

The Conductor Impedance Mismatch Tool provides the following Global filters:

Global Filter	Description
All	Shows all conductors with impedance mismatches.
Confirmed Correct	Shows all conductors whose impedance mismatches are confirmed correct.
Confirmed Error	Shows all conductors whose impedance mismatches are confirmed error.
Confirmed Error and New	Shows all conductors whose impedance mismatches are confirmed error and all new mismatches.
New	Shows all new conductor impedance mismatches.

Conductor Impedance Mismatch Tool Report

The conductor impedance mismatch tool report has following columns:

1. **Feeder:** Name of the feeder where the mismatched conductor is found.
2. **Phase:** Phase of the feeder where the mismatched conductor is found.
3. **Conductor:** Name of the mismatched conductor.
4. **Conductor Catalog:** Name of the catalog of the mismatched conductor.
5. **Connected Conductor:** Name of the conductor against which mismatched conductor is compared.
6. **Connected Conductor Catalog:** Name of the catalog of the conductor against which mismatched conductor is compared.
7. **Percent Difference:** Percentage impedance difference between the mismatched conductor and the connected conductor.
8. **Error Type:** Name of the possible error type.

   Note: If needed, you can select multiple rows within the report and copy and paste to an external application.

The status bar indicates the number of rows in the report and includes an indicator that spins when calculations are in progress.

Chapter 13

Suggested Switching

This chapter covers the following topics:

- Introduction
- Suggested Switching Scenarios
- Using the Suggested Switching Tool
- Using the Suggested Switching Solutions Tool

Introduction

Oracle Utilities Network Management System Suggested Switching helps you generate switching steps for two fundamental types of scenarios:

- **De-energizing and isolating an energized device.**

  Suggested Switching produces steps to isolate and deenergize devices while minimizing the amount of resulting dropped load.

- **Restoring power to a de-energized device.**

  Suggested Switching produces restoration steps by solving the power flow for each eligible tie point with adjacent feeders, in order to determine the remaining feeder capacity and the overloads after the de-energized section is picked up.

Suggested Switching Scenarios

- **Isolate Only**: A fault has occurred on a device or emergency maintenance is needed on a device. Suggested Switching can be used to generate the optimal switching steps to completely isolate the device from the system and evaluate the loads to be lost if no further restoration actions are implemented.
- **Isolate and Restore**: Suggested switching can be used to isolate a device from the system and restore downstream sections. If the selected device is already de-energized then upstream sections may also be restored.
- **Load Restore**: A de-energized area caused by planned or actual outages must be restored. Suggested Switching can be used to generate recommended switching plans to try to restore the loads as much as possible, and operate switches as little as possible.
- **Feeder Unloading**: A feeder is highly over-loaded, and some of its loading must be transferred to neighboring feeders or sources to avoid equipment damage or low voltages on the feeder. Based on system topology configurations, Suggested Switching will determine the optimal switching plans to transfer the required amount of loads from the specified feeder.
- **Violation Relief:** Use DERs and network reconfiguration to relieve overload and voltage violations.
- Substation Switching
    - **Breakers**: One or more substation breakers need to be taken out of service for maintenance, so the feeders supplied from these breakers must be fed from alternate sources. Suggested Switching will create a plan whereby these breakers can be opened and the load on the feeders can be transferred to alternate supplies.
    - **Power Transformer**: A substation has two parallel power transformers, and one transformer needs to be taken out of service. Suggested Switching can be used to generate optimal switching plans to maximally transfer all existing feeders supplied by the transformer to adjacent power transformers or adjacent substations.

Using the Suggested Switching Tool

You can use the Suggested Switching tool to generate a set of steps that can be inserted into a new switching sheet or appended to an existing switching sheet.

Appending Steps to an Existing Switching Sheet

If you want to add steps to an existing sheet, do the following before you run the Suggested Switching tool:

1. Start Web Switching Management.
2. Create or select a planned switching sheet to append the optimization plan steps.
3. Click the **Record** button to enable recording. (This is required in order for optimization steps to be appended from the wizard.)

Selecting Devices

1. Select one or more devices in the Viewer, based on the switching scenario you want to perform:
    - **Isolate Only:** Select a single or multiple energized or de-energized devices. Optimum performance with multiple devices occurs if the devices are near each in the model.
    - **Isolate and Restore:** Select a single or multiple energized or de-energized devices. Optimum performance with multiple devices occurs if the devices are near each in the model.
    - **Restore:** Select a single de-energized device.
    - **Feeder Unloading:** Select one or more devices that identify a single feeder.
    - **Violation Relief:** Select one or more devices that identify a single feeder.
    - **Substation Switching:** Select one or more devices of the correct type, such as power transformers or breakers.

    Note: To select more than one device, press the CTRL key while clicking the devices in the Viewer.

Starting the Suggested Switching Tool

The Suggested Switching tool uses a wizard approach that steps you through a series of pages to gather input, generate plan options, and, finally, provide the results of the chosen plan for use in a new or existing switching sheet. To start the Suggested Switching wizard:

1. With devices selected, select **Suggested Switching...** from the Viewer **DMS** menu.

Understanding the Suggested Switching Tool Window

The Suggested Switching window is divided into three areas:

1. **The Context Pane (left)**: shows the steps in the wizard. Completed steps are shown in normal text, the current step is bolded, and the remaining steps are grayed out.
2. **The Main Pane (right)**: provides the user options or results of wizard.
3. **The Button Pane (lower):** contains the following buttons:
    - **Back:** Moves the wizard back to the previous page.
    - **Next:** Moves the wizard to the next page, as listed in the context pane on the left side of the window.
    - **Cancel:** closes the Suggested Switching wizard. (Note that any selections or changes made to parameters on any of the pages will be lost.)
    - **Help...:** Opens the online help system to the Suggested Switching tool help content.

Selecting a Plan Type

Plan Type is the first page of the Suggested Switching wizard. It allows you to select the type of suggested switching operation to perform and whether only SCADA devices should be used in the plan.

1. Select a Plan Type

   Note: Once a Plan Type is selected, the context pane will be updated to list the applicable pages in the wizard.

Plan Type	Description	Pages in Wizard
Isolate Only	Isolate the selected devices.	Plan Type Constraints Plans Summary
Isolate and Restore	Isolate the selected devices and try to restore as many downstream sections as possible.	Plan Type Load Scenario Constraints Feeder Ties Plans Summary
Restore	Restore the selected de-energized devices.	Plan Type Load Scenario Constraints Feeder Ties Plans Summary
Feeder Unloading	Transfer load from a single feeder containing the selected devices.	Plan Type Unload Feeder Load Scenario Constraints Feeder Ties Plans Summary
Violations Relief	Relieve overload and voltage violations a single feeder containing the selected devices.	Plan Type Load Scenario Constraints Feeder Ties Plans Summary
Substation Switching	Isolate one or more substation devices.	Plan Type Load Scenario Constraints Feeder Ties Plans Summary

   Note: The Plan Types options will be desensitized if they are not valid for the selected devices.

2. Click **Next** to proceed to the next step in the wizard.

Unload Feeder

The **Unload Feeder** page allows you to modify values for load to transfer from the feeder to adjacent feeders for each phase. The Unload Feeder page is **only** available when the Feeder Unloading plan type is selected.

1. Enter the load capacity in amps for A phase, if applicable.
2. Enter the available load capacity in amps for B phase, if applicable.
3. Enter the available load capacity in amps for C phase, if applicable.
4. Click **Next** to proceed.

Load Scenario

The **Load Scenario** page is used to verify or modify the power flow load and limits scenario, which will be used to determine the best plan options. When the window opens, the default values for load profile, temperature, scaling factor, and limits are visible in read-only mode; to change the scenario, click the **Modify** button to open the **Power Flow Study Mode Load Scenario** dialog box (see **Understanding the Power Flow Study Mode Load Scenario** on page 12-16 for details).

1. View and modify the load scenario, as necessary.
2. Click **Next** to proceed to the **Constraints** page.

Constraints

Constraints determine acceptable system conditions for the suggested switching results.You can constrain the algorithm that determines the plan by selecting from the following options:

- **Only use SCADA devices**: select to constrain Suggested Switching to only consider SCADA operable devices for the switching plans. This allows you to create plans that can be operated from the Control Room without sending a crew to the field.
- **Exclude devices with inhibit tags:** select to constrain Suggested Switching to switches with no inhibit tags. The inhibit tag classes are configured via the Suggested Switching, Inhibit Classes rule in the Configuration Assistant, Event Management tool.
- **Minimize impacted area with non-load break switches** will cause Suggested Switching to include non-load devices in the plan. Intermediate steps will be added to first de-energize the non-load device for operation, and then subsequently reverse the intermediate steps.
- **Allow dispatch DG to achieve objectives** will cause Suggested Switching to include the dispatch of controllable DER resources to achieve desired results.
- **Allow shed load to achieve objectives** will cause Suggested Switching to consider scenarios where load can be dropped to prevent overloads from occurring.
- **Disconnect DG (IEEE-1547 rules)** will cause Suggested Switching to emulate DER disconnections during recent re-energization events. Therefore, in Restore scenarios, DER devices will be disconnected for the purpose of evaluating load.

- **Cold load pickup** will cause Suggested Switching to increase the load in de-energized areas for Restore scenarios. The amount of increase is determined by the **Cold Load Pickup Percent** rule available in the Configuration Assistant.
- **Evaluate protection reach violations** will enable protection reach and unprotected device violations to be generated. These are only evaluated for the plan as a whole (as opposed to individual steps) and are only visible on the Feeder Summaries in the plan details.
  - A Protection Reach violation is a protective device that doesn't provide adequate protection for all devices downstream.
  - An Unprotected Device violation is a device that is not adequately protected by the immediate upstream device.
- **Force kVA engine** will cause Suggested Switching to perform a kVA based analysis on the load flows even if the section of the network is configured to use Power Flow solutions. kVA solutions are faster, but they do not analyze voltages so low/high voltage conditions will be missed.

Once you have selected the constraints, click **Next** to proceed.

Feeder Ties

The **Feeder Ties** page displays a list of tie switches to feeders that are adjacent to the selected feeder. Various details about the tie switches are displayed including:

- **Tie Switch:** the name of the tie switch.
- **Feeder:** the name of the feeder.
- **Substation:** the name of the substation that supplies the feeder.
- **Tie Capacity:** the tie switch and the upstream supply.
- **Fdr Capacity:** the capacity of the feeder.
- **Distance:** distance to feeder head.
- **Avg Volt:** the average voltage.
- **Min Volt:** the minimum voltage.
- **Solution Mode:** the load flow solution mode (that is, Power Flow or kVA) used to calculate the data.

The tie switches are listed the table in priority order.

1. If you do not want a feeder to be used for load transfers, uncheck the box in the **Use** column.
2. To view a switch in the Viewer, select the switch in the list and click the **View...** button.
3. To change the priority order of the tie switches, select a tie switch in the list and click the **Move Up** or **Move Down** button, as applicable. Switches higher in the list are given higher priority.
4. Click **Next** to proceed.

The suggested switching algorithm computes the suggested switching plans based on settings from all the wizard pages that have been filled in to this point.

To direct the search for the best suggested switching plan, all of the tie points are given a rank between 0 and 1. Zero represents the least favorable tie point and one represent the most favorable tie point.

The rank of a tie point is determined by aggregating the weighted scores of various parameters such as minimum voltage, average voltage, distance to feeder head, and so on. The score of the parameter is multiplied by the weight of the parameter to get the weighted score of the parameter.

Plans

The **Plans** page displays a list of plans generated by the Suggested Switching tool and overview information for each plan.

- **# Steps:** is the number of switching steps in the plan.
- **Affected Feeders:** lists the feeders affected by the plan.
- **Affected Switches:** lists the switches affected by the plan.
- **Customers Impacted:** summarizes the number of regular and critical customers that are impacted by the plan. The counts are further divided into customers that are fully impacted and those that may be temporarily impacted by intermediate steps to allow non-load break operations.
- **Affected DERs:** summarizes the number of primary and secondary distributed energy resources (DERs) that are impacted by the plan. DERs, which can form island and act as source, are defined as primary.
- **Violations Before:** the number of violations before the plan is implemented.
- **Violations After:** the number of violations if the plan is implemented.

  Note: You may stop the system from generating additional plans by clicking the **Stop Solution** button. The button is only available when the system is still processing solutions (that is, neither the **Maximum Number of Plans** or the **Maximum Time to Search** have been reached).

To view detailed result data and steps for a plan, select the plan in the Plans list and click the **Plan Details....** button, which will open the **Suggested Switching Plan Details** window.

Suggested Switching Plan Details

The Suggested Switching Plan Details window provides information about the plan's switching steps and feeder status.

- **Switching Steps Tab:** The Switching Steps tab shows the individual switching steps and the effects of each switching step on the feeder where its load is being transferred Associated switching step violations and affected DERs are shown to the right.
- **Switching Step Violations:** Tree view is displayed with the total number of violations in feeders and type of each violation along with associated device.
- **Affected DERs:** Tree view is displayed with the total number of affected DERs in feeders with type and its information.

- **Feeder Changes Tab:** The Feeder Changes tab shows the net effect of all switching changes on each of the affected feeders. This view clearly shows the net change in violations and affected DERs before and after all switching steps are performed.

Click **Close** to return to the Plans page.

1. Once you have decided which plan to use, select it in the Plans list.
2. Click **Next** to proceed to the **Summary** page.

Summary

The **Summary** page displays the selected plan's Switching Summary for your review and allows you to insert or append the switching steps into a switching sheet.

- To save these steps in a new switching plan, click the **Create Plan...** button. The wizard closes, and a new planned switching sheet opens in the Web Switching Management window. The newly generated plan's **Request** tab will be populated with all relevant device related data.
- To insert these steps into a currently open switching sheet, click the **Append Steps...** button. The steps are inserted into the open sheet in the Web Switching Management window.

See **Planned Switching** on page 11-16 for more information about Web Switching Management.

Using the Suggested Switching Solutions Tool

You can use the Suggested Switching Solutions tool to access previously generated suggested switching solutions or to view generated feeder contingency analysis (FCA) plans. The tool has two tabs:

- The **Suggested Switching Solutions** tab shows plans that were previously generated with Study Mode Suggested Switching.
- The **Feeder Contingency Analysis** tab displays contingency plans that represent the most viable option to transfer all load from a feeder to adjacent feeder(s).

The Suggested Switching Solutions tool can be used to either create a new switching sheet with the same steps or append the steps to an existing switching sheet. For more information on how to generate suggested switching solutions, see **Using the Suggested Switching Tool** on page 13-3.

Suggested Switching Tool Menus and Toolbar Options

File Menu

Menu Option	Description	Toolbar Icon
Print Preview...	Opens the Print Preview dialog box.	
Exit	Closes the Suggested Switching Solutions tool window.	--

Help Menu

Menu Option	Description	Toolbar Icon
Suggested Switching Solutions Help	Opens the online help system to the Suggested Switching Solutions tool help content.	--

Suggested Switching Solutions Tab

The Suggested Switching Solutions tab displays a list of plans that were previously generated by Suggested Switching in study mode (see **Using the Suggested Switching Tool** on page 13-3 for information). This allows you to go back to results that may have been generated days earlier such that comparisons can be conducted or an optimal plan recalled. The results are presented in an expandable tree view with unique identifiers for each solution.

Toolbar Options

Button	Description
	Reloads the entire table displaying any newly created Suggested Switching Solutions.
	Displays the suggested switching plan details for the selected row. This will show pertinent information such as steps, power flow results, affected feeders, and overload information.
	Displays the main feeder being affected by the Suggested Switching Steps.

Suggested Switching Solutions Table

The suggested switching solutions table contains the following columns:

- **SS Scenario:** The objective of the suggested switching plan (for example, **Isolate and Restore**, **Isolate**, **Feeder Unloading**).
- **# Steps:** The number of steps contained within the plan.
- **Affected Feeders:** A total list of feeders affected by this plan.
- **Affected Switches:** A total list of switches being used by the plan to energize and de-energize sections of the feeder based on the particular objective.
- **Customer Impacted:** A breakdown by count of customers that will be impacted by execution of the plan. This will include sub breakdowns of things such as critical customers.
- **Affected DERS:** A total list of distributed energy resources (DERs) impacted by the plan.
- **Violations Before:** The number of total violations within the area impacted by the suggested switching plan before plan execution.
- **Violations After:** The number of total violations within the area impacted by the suggested switching plan after plan execution.

Feeder Contingency Analysis Tab

The Feeder Contingency Analysis tab displays a list of plans generated by the FCA process. FCA is a suggested switching contingency analysis batch process that determines how all loading on an entire feeder could be transferred to adjacent feeders using available tie switches. The analysis is run for all feeders within the Oracle Utilities Network Management System data model. The analysis is run against the as-built topology and is intended to provide insight on whether loading on an entire feeder could be transferred to adjacent feeders without causing overloads.

The *Distributed Generator for FCA* and *Load Profile Temperature for FCA* SRS rules can be used to configure the default distributed generation map that should be used with FCA analysis. If either of these rules are not configured, then FCA is set to run with the default generator and temperature profiles, which is configured using Distributed Generator Default and Load Profile Temperature Default SRS rules.

> **Note:** The analysis is intended to be run by an administrative user quarterly since it is conducted against the as-built model.

Toolbar Options

Button	Description
	Displays the dialog box that allows you to sort the results table as desired.
	Displays the dialog box that allows you to filter the table as desired.
	Reloads the entire table displaying any newly created Feeder Contingency Analysis plans.
	Displays the Feeder Contingency Analysis plan details for the selected row. This will show pertinent information such as steps, power flow results, affected feeders, and overload information
	Displays the main feeder being affected by the Suggested Switching Steps.
	Resolves the rows that are currently selected in the table. This would be used for situations where the as-built topology changed for a feeder that is being analyzed, but the quarterly resolve has not been conducted by the system administrator.
	Opens the Feeder Contingency Analysis dialog box, which allows the user input the analysis runtime in minutes.
	Stops the feeder contingency analysis if it has not already finished.
	Copies selected rows.
	Opens a confirmation dialog box that allows you to purge old analysis results.

Feeder Contingency Analysis Table

The feeder contingency analysis table contains the following columns:

- **Substation:** The feeder's substation.
- **Feeder:** The feeder that was analyzed for contingency analysis. This feeder represents the feeder that will have all loading transferred to adjacent feeders.
- **# Steps:** The number of steps contained within the plan.
- **kVA Overload:** The amount of KVA that adjacent feeders will be overloaded as a result of picking up all loading from this particular feeder.
- **Date:** The date the analysis was last conducted.
- **Pickup Feeders:** The feeders that will be utilized to pickup all load served by the feeder listed in the **Feeder** column.

Creating Switching Sheets with the Suggested Switching Solutions Tool

If you want to create a switching sheet with steps from a previously generated Suggest Switching Solutions or Feeder Contingency Analysis plan, do the following:

1. Select **Suggested Switching Solutions...** from the Web Workspace **Tools** menu.
2. Then, depending on the desired plan type to be generated, select either the **Suggested Switching Solutions** tab or **Feeder Contingency Analysis** tab.
3. Select a solution to see overview information for each plan generated for the solution.

   Note: In the **Suggested Switching Solutions** tab, expand the tree view to see an overview of the solution details.
4. Right-click a plan name and select **View Plan Details**. The Suggested Switching Plan Details dialog box will open.
5. Click **Create Plan** to create a new switching plan.

Appending Steps to a Switching Sheet with Suggested Switching Solution

The Suggested Switching Solutions tool allows you to append steps from a previously generated Suggested Switching Solutions or Feeder Contingency Analysis plan to an existing switching sheet. With an existing switching sheet in record mode, do the following:

1. Select **Suggested Switching Solution...** from the Web Workspace **Tools** menu.
2. Then, depending on the desired plan type to be generated, select either the **Suggested Switching Solutions** tab or **Feeder Contingency Analysis** tab.
3. Select a solution to see overview information for each plan generated for the solution.

   Note: In the **Suggested Switching Solutions** tab, expand the tree view to see an overview of the solution details.
4. Right-click a plan name and select **View Plan Details**. The Suggested Switching Plan Details dialog box will open.
5. Click **Append Steps** to append the steps to the switching sheet.

Chapter 14

Network Optimization Tool

This chapter covers the following topics:

- Introduction
- Running Optimization in Study Mode
- Using Optimization in Real-Time Mode

Introduction

The Network Optimization Tool (Optimization) generates a set of optimal substation power transformer tap positions, voltage regulator tap positions, capacitor bank statuses, and DER/DR power dispatch controls for a defined optimization objective. The following optimization objectives are currently supported:

- **Loss Minimization**
- **Power Factor Correction**
- **Conservation Voltage Reduction**
- **Relieve Violations**
- **Maximize Voltage**
- Maximize VAr
- **Return to Nominal**

Optimization can be used in study mode or real-time.

- In study mode, you can generate optimization steps based on your optimization objective and then either append the steps to an existing switching plan or create a new switching plan. The switching plan can then be transitioned and executed in real-time mode.
- In real-time mode, Optimization runs cyclically to generate optimal plans for configured areas of the network. Areas can be configured for either *manual mode*, which will force you to review the plan before execution, or *automatic* mode, which will allow the system to execute the plan without user interaction to constantly keep areas optimized based on changing conditions. For more information see **Using Optimization in Real-Time Mode** on page 14-5.

Understanding Optimization Weighting Factors

The weighting factors for controls and constraints need to be set to consider in network optimization. Administrative users can view or change these settings using the Configuration Assistant's Event Management Rules tab's Optimization Objective Parameters (see **Using the Event Management Rules Tab** on page 24-16 for more information). These settings are used by the Optimization tool for both study and real time modes.

Using Optimization in Study Mode

In Study Mode, Optimization uses a wizard approach that steps you through a series of pages to gather input and then presents the results. This allows you to maintain context and easily move backward and forward in the process, as needed.

Optimization allows you to specify a particular loading scenario against which to perform the analysis. Based on the selected load scenario, Optimization uses the real-time load values or load values from the historical load profile for all load points in the analysis area. The user-selectable load scenarios are:

- Real-time loads
- Scaled loads
- Peak loads
- Specific period loads

In addition, you can specify the type of device controls to consider for the analysis.

Based on these settings, the tool generates a plan summary and detailed results for individual feeders, along with any violations or dropped loads. A set of implementation steps is also presented, showing substation transformer tap position changes, capacitor bank status changes, and/or DER real/reactive power output changes. You can save these steps in a new switching sheet or insert them into an open switching sheet.

> **Note**: Optimization uses Web Switching Management functionality and is only available if you are running Web Workspace as the Full Operations plus Web Switching user type. See Understanding User Types and Web Switching Management for more information.

You can use the Optimization wizard to generate a set of steps that can be inserted into a new switching sheet or appended to an existing switching sheet. If you want to add steps to an existing sheet, do the following before you run the optimization tool:

1. Create a new planned switching sheet or open an existing sheet.
2. Click the **Record** button to enable recording. This is required in order for optimization steps to be appended from the wizard.

Before you run Optimization, select a single device in the Viewer that is connected to the area you want to optimize. The analysis works on a substation bus level and will optimize all feeders fed by the bus. For example, if a substation has two low voltage (LV) buses separated by a normally open switch, the analysis would only optimize devices in the selected bus area. Before you run Optimization, select one or more devices in the Viewer that identify the feeders that you want to optimize. To select more than one device, hold down the CTRL key and click the devices.

Running Optimization in Study Mode

To start Optimization, select a single device that is in the bus area you wish to optimize in the Viewer, and then select the **Optimization...** option from the Viewer **Tools** menu. This option is only enabled if a device is currently selected in the Viewer and DMS is enabled in your study session for your user type.

Each screen in the Optimization wizard displays a context pane on the left side of the screen, which shows all the steps in the optimization process. Completed steps are shown in normal text, the current step is bolded, and the remaining steps are grayed out.

The wizard displays the following pages:

- Options
- Load Scenario
- Result Plan
- Summary

The buttons at the bottom of the dialog box allow you to step forward and backward through the process or exit the tool.

Options

Options is the first page of the wizard. It displays the selected device and allows you to specify the basic parameters to use for the optimization.

Options has three sections:

- **Objective:** allows you to select from the following objectives.
  - **Return to Nominal:** Select this to generate steps to return regulation devices to their nominal regulation settings. The nominal settings are stored in the NMS database and will used in the steps generated by the Optimization tool. The application will attempt to restore any set-points, on/off thresholds, position, or step that would be different from the nominal value. For example, a substation LTC may have two steps to return it to nominal; the first step would be to adjust the voltage target set-point and the second would be to adjust the tap step.
  - **Loss Minimization:** Select this to run Optimization for minimizing losses.
  - **Conservation Voltage Reduction:** Select this to run Optimization for demand reduction. This objective will attempt to reduce technical losses by controlling load tap changer (LTC) tap positions, voltage regulator tap positions, and capacitor bank statuses.
  - **Power Factor Correction:** Select this to run Optimization for power factor correction. This objective will attempt to control capacitor bank statuses to bring the power factor as close to unity as possible.
  - **Relieve Violations:** Select this to run Optimization to relieve voltage and overload violations in the selected area. This objective will attempt to dispatch DERs and control load tap changer (LTC) tap positions, voltage regulator tap positions, and capacitor bank status to reduce violations in the selected area.

  Note: DERs will be used only when the DERMS module is licensed.

- **Maximize Voltage:** Select this to run Optimization to maximize voltage in the selected area. This objective will attempt to increase the average voltage on each feeder within the optimization area by controlling load tap changer (LTC) tap positions, voltage regulator tap positions, and capacitor bank statuses.
- **Maximize VAr:** Select this to run Optimization to maximize reactive power in the selected area. The objective will attempt to increase the reactive power support within the optimization area by controlling load tap changer (LTC) tap positions, voltage regulator tap positions, capacitor bank statuses, and reactive dispatch at DER units.

- The **Controllable Devices** list displays the regulation devices that can be optimized.
  - The **Device Name** column displays the controllable device names.
  - The **Optimize** column allows you to select or deselect devices to include in the optimization. By default, optimization is selected for all of the controllable devices.
  - The **SCADA** column indicates whether the device is SCADA enabled or not.
  - The **Fixed Price** column represents the fixed cost to operate the device and is applicable to all types of devices.
  - The **Utilization Price** column is only applicable to DER resources and represents the variable pricing in dollars per MWh.

Load Scenario

The Load Scenario page allows you to change the load profile, scaling factor, and limits. When you click modify, it opens the Power Flow Study Mode Load Scenario window. See **Understanding the Power Flow Study Mode Load Scenario** on page 12-16 for details.

Result Plan

The next page of the wizard gives an overview of the analysis results. The information on this page cannot be changed. Use the **Plan Details** button to display more detailed result data for individual feeders.

- The **Summary** provides a tabular view of the minimum voltage (%), maximum voltage (%), loading (real/reactive power), real power reduction (%), Power Factor Change, DER Gen output, losses (kW), Power Factor (negative for leading and positive for lagging), and violations/warnings before and after optimization.

  Note: The real power reduction (%) will be displayed for Conservation Voltage Reduction/Relieve Violations, the loss reduction (%) will be displayed for Loss Minimization, the power factor change will be used for Power Factor Correction, (%) increase in maximum voltage will be displayed for the Maximize Voltage, and (%) increase in VAr support will be displayed for the Maximize VAr objective.

- The **Plan Implementation Steps** lists the switching steps required to implement the optimization plan. To target the Viewer to a device affected by a step, select the step and click the **View...** button.
- The **Voltage Distribution on Affected Feeders** graph displays the voltage distribution on affected feeders before (in gray) and after (in blue) changes are made.
- Click **Plan Details...** to view results.

Plan Details

When you select a feeder from the Feeders list on the top of the page, the following details are shown:

- **Violations** tree table shows any violations associated with the selected feeder. To see the device associated with the violation, select a violation in the Feeder Violations list and click **View...**. (This button is enabled whenever a violation node is selected.)
- **Voltage Profile Graph** for the selected feeder. To see the graph, select the tab Voltage Profile graph in the tabbed pane. This graph shows the relationship of load voltages as a function of distance from feeder start point before and after the optimization steps are implemented. This is useful for seeing how voltage drops, and how close load points are getting to their voltage limits.
- **Voltage Distribution Graph** for the selected feeder. To see the graph, select the tab Voltage Distribution graph in the tabbed pane.

Summary

The Summary page displays the implementation steps for the plan.

To save these steps in a new switching plan, click the **Create Plan...** button. The Optimization wizard closes, and a new planned switching sheet opens in the Web Switching Management window.

To insert these steps into a currently open switching sheet, click the **Append Steps...** button. The steps are inserted into the open sheet in the Web Switching Management window.

See **Planned Switching** on page 11-16 for more information about Web Switching Management.

Using Optimization in Real-Time Mode

In real-time mode, when enabled, Optimization runs in the background and generates recommendations for the current network topology using predicted loads for the short-term future (for example, 4 to 6 hours).

Setting the Optimization Mode

To enable a feeder for Optimization, the feeder type must be Primary Xfmr or Primary. The feeder type can be set using Configuration Assistant Feeder Management Tab (see **Using the Feeder Management Tab** on page 24-32 for details).

The Feeder's Optimization Objective can be set to **Conservation Voltage Reduction**, **Loss Minimization**, **Power Factor Correction**, **Relieve Violations**, or **Maximize Voltage** using Configuration Assistant Feeder Management Tab (see **Using the Feeder Management Tab** on page 24-32 for details). Power Factor Correction will solve for a loss minimization objective, but only consider using capacitors, not LTCs or Line Regulators.

Optimization can be set to run Fast Cycle, which occurs at the end of each Feeder Load Management (FLM) cycle, or Slow Cycle, which occurs at the end of each FLM forecast.

Optimization supports four different modes of operation:

- **Disabled:** Optimization does not run.

  Note: When a single feeder(s) is set for **Disabled** mode, Optimization will restore the feeder's regulation devices to nominal during the next optimization cycle. During this scenario, the plan may consist of a blend of optimization steps and return to nominal. For example, if one feeder on a bus containing five feeders was set to **Disabled**, the steps would consist of return to nominal for that feeder and optimization for the other four feeders (see **Using the Feeder Management Tab** on page 24-32 for details on disabling a single feeder).

- **Manual:** Optimization runs periodically for every hour and configured FLM cycle time. Feeders that require optimization in specific periodic execution can be set with desired objectives modes of the feeders in the Configuration Assistant Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). It checks the real-time load scenario, and recommends DER dispatch and shunt device, transformer, and regulator status changes, if there is a significant benefit. The recommendation plan will not be executed automatically.

  - An operator may view recommendations by opening the Optimization solution.
  - An operator has to manually create a switching sheet from the plan and execute it.

- **Automatic:** Optimization runs periodically for every hour and configured FLM cycle time. Feeders that require optimization in specific periodic execution can be set with desired objectives and modes of the feeders in the Configuration Assistant Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). However, the status of the other feeders on the same substation Load Tap Changer can influence the mode of this feeder. It checks the real-time load scenario and recommends shunt device and transformer/ regulator status changes, if there is a significant benefit. The recommendation plan will be executed silently. An event (O-NEW) will be created and displayed in the Work Agenda for the plan execution.

- **Return to Nominal:** During the next optimization cycle, Optimization will begin returning all optimization enabled devices to their nominal regulation settings. The plans will be executed automatically in real-time. This would generally be used for situations where the entire service territory needs to be returned to nominal (for example, due to an impending storm or other emergency situation). The nominal settings are stored in the NMS database and will be used in the steps generated by the tool. The application will attempt to restore any set-points, on/off thresholds, position, or step would be different

from the nominal value. For example, a substation load tap changer (LTC) may have two steps to return it to nominal; the first step would be to adjust the voltage target set-point and the second would be to adjust the tap step.

Note: The **Return to Nominal** mode is not set on a single feeder or group of feeders; it is a global mode that is accessible from the Web Workspace **Tools** menu and applies to all Optimization enable feeders.

To set the optimization mode, from the Web Workspace **Tools** menu, select **DMS Settings**, and then **Optimization Mode**, and, finally, select the desired mode (**Disable**, **Manual**, **Automatic**, or **Return to Nominal**). Also select the desired Optimization modes of the feeders in the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). Note that Feeder Load Management must be running for the Optimization Mode options to be enabled; see Chapter 17, Feeder Load Management for more information. Also make sure that the FLM mode of these feeders is set to **Forecasting** in the Configuration Assistant Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details).

Understanding Optimization Events in the Work Agenda

The Work Agenda **DMS Status** column provides information about Optimization events and results of the calculations. When row or cell coloring is enabled in the **Web Workspace** (see **Understanding the Table Settings Menu** on page 2-9 for more information), the **DMS Status** information is color coded. Possible Optimization status results:

DMS Status Column	Description
Optimization Solution Generated	Optimization has found a solution.
Optimization Solution Generated with Violations	Optimization has generated a solution, but it contains violations; manual intervention is required if in automatic mode.
Optimization Automatically Executing	In automatic mode, Optimization has generated a plan and is automatically executing the plan.
Optimization Automatically Executed	In automatic mode, Optimization has generated a plan and has automatically executed it.
Optimization Automatic Execution Failed	In automatic mode, Optimization has generated a plan and attempted to automatically execute it, but it failed.
Optimization Manually Aborted	Optimization processing or execution has been aborted by a user.

Understanding the Number of Retries for a Timed Out Step

If no response (related to a plan's switching action) is received from SCADA within the configured timeout period, then the switch step status will be set to a value of *Failed*. When the Optimization plan is executed in automatic mode, or when the plan is manually executed using the **Execute the entire plan** toolbar option, the plan execution can retry a timed out step for configurable number of times before it sets the status of the switch step to *Failed*.

Configuring the Number of Retries for a Timed Out Step (Administration Users)

To allow the plan to retry the actions when they time out, configure the rule **DMS Switching Step Fail Retries and Wait Time** in the Configuration Assistant **Event Management Rules** tab.

> **Note:** The rule may be searched for or you may expand **DMS Application Rules** and then **SCADA Measurement Rules**.

Add an instance of this rule for **Optimization** plans. Configure the following:

- **rule_value_2:** Enter the Optimization sheet class (found in the SWMAN_SHEET_CLS table).
- **rule_value_integer_1:** Enter the maximum number of retries to perform before setting the step as *Failed*.
- **rule_value_integer_2:** Enter the time to wait before retrying the action.

See **Using the Event Management Rules Tab** on page 24-16 for more information on configuring rules.

Aborting an Optimization Plan

To abort an Optimization plan from the Work Agenda, right-click the Optimization event and select **Abort DMS Processing** from the context menu.

Alternatively, in the Optimization switching plan, right-click the Optimization event in the Events table and select **Abort DMS Processing** from the context menu.

Tracking Number of Operations on Capacitors and Penalizing Them

To limit the over utilization of capacitors and mechanical wear on capacitors, the number of **close** operations on SCADA capacitors are tracked on a device by device basis. If the count of the operations on a capacitor (in a configurable time period) exceeds a threshold configured for the class of the device, then Volt/VAr optimization will penalize the capacitor in its real time plans. First the optimization will try to come up with a feasible plan by excluding the capacitor. If there are still violations, then it will attempt to use the excluded capacitor to relieve more violations.

Configuration (Administration Users)

To enable this, the following SRS rules need to be configured using Configuration Assistant.

Rule: Capacitor Operations Count Penalty Threshold

- **Rule_value_1:** Class name of the capacitors
- **Rule_value_2:** Threshold count of close operations to penalize a capacitor

Rule: Capacitor Operations History Period

- **Rule_value_2:** Number of days to consider back in time to count the close operations. By default, it is one day (last calendar day).

Rule: Use Rolling Period Capacitor Operations Count to Penalize

- **Rule_value_1:** `yes` or `no`. By default, it is `no` (use the count of operations in the last calendar day). If it is set to `yes`, then the operations in the last 24 hours are used to determine the count and penalize the capacitors.

Rule: Capacitor Operations Penalty Weight

- **rule_value_integer_1:** Enable: 0 - No, 1 - Yes. Default: 0.
- **rule_value_2:** Weight.

Note: Currently weight is not in use. Optimization penalizes a capacitors whose operations exceed a threshold by excluding it, if **rule_value_integer_1** is set to `1`. If there are still violations in the plan, it checks if the capacitor can help relieve them. If it helps, then it will come up with a plan that includes the capacitor.

Viewing the Optimization Report

Right click an Optimization event row in the Work Agenda and select the **Optimization Report** option. The Optimization Report tab opens in the Event Details window with its list of feeders affected and recommended solution.

Optimization Report Menus and Buttons

File Menu

Menu Option	Description	Toolbar Icon
Print...	Displays the Print Preview window to allow you to print the Recommendation Plan.	

Actions Menu

Option	Description	Toolbar Icon
Generate Switch Plan	Used to convert the recommendations into an actual Optimization plan for execution. This is only necessary in **Manual** mode.	

Button

- **Plan Details...**: opens the Plan Details window. See **Plan Details** on page 14-13 for more information.

Understanding the Summary Pane

The Summary pane shows details for the plan and represents high level details for the optimization area. Before a plan is executed only the **Before** and **After (Estimate)** details will be populated. Once a plan has been executed and the power flow resolved, the **After (Actual)** will be populated. By showing both the estimate and the actual, you can compare the results to determine if any adjustments need to be made to the underlying DMS data (for example, inaccurate load profiles creating incorrect estimates).

Summary Information

- **Min Volt (%):** The minimum service voltage in the optimization area.
- **Max Volt (%):** The maximum service voltage in the optimization area.
- **Loading:** The total loading in the affected area showing both real and reactive power.
- **% Reduction (kW):** This value will be displayed when Conservation Voltage Reduction, Loss Minimization, or Relieve Overloads objectives are selected. For Conservation Voltage Reduction or Relieve Overloads, it will display the percent change in reduced demand. For Loss Minimization, it will display the percent change in reduced losses.
- **DER Gen:** The total DER output in the optimization area for real and reactive power.
- **PF Change:** This will only display for the Power Factor Correction objective and will display the change in power factor.
- **% Voltage Change:** This value will be displayed for the Maximize Voltage objective. It will display the percent change in maximum voltage by executing the optimization plan.
- **% Increase (kVAr):** This value will be displayed for the Maximize VAr objective. It will display the percent change in reactive VAr support by executing the optimization plan.
- **Losses (kW):** The total losses in the optimization area.
- **Power Factor:** The overall power factor for the optimization area.

  Note: Power factor will be negative for leading and positive for lagging.
- **Violations:** The total number of violations in the optimization area.
- **Warnings:** The total number of warnings in the optimization area.

Optimization Messages

The **Optimization Messages** section displays pertinent information related to an optimization event. This section is displayed in a tabular format with configurable and translatable messages. The messages contain error information as well as general information such as timing to execute a plan, to create the plan, to update a plan, and so forth. This dialog box also has a related context menu that lets you navigate to devices mentioned in the messages.

Recommendation Plan

This section of the report gives details of the plan, including Substation, Feeder, and Device level information. The device level information shows the before and after position settings as determined by Optimization.

Select a device row, right-click, and select **View...**to launch the Viewer with the device in focus.

Plan Details

The Plan Details window has a Feeder pane and a tabbed pane that displays information about a selected feeder.

Feeders Pane

The Feeders pane lists all of the feeders affected by a solution and provides details about load and violations before and after the optimization plan is executed. Before a plan is executed only the **Before** and **After (Estimate)** will be populated. Once the optimization plan has been executed and the power flow resolved, the **After (Actual)** values will populate.

Tabbed Pane

When you select a feeder from the Feeders list, the following tabs are displayed:

- **Violations:** shows any violations associated with the selected feeder. To focus the Viewer on the device associated with the violation, select a violation in the list and click the **View...** button.

  Note: The **View...** button is enabled whenever a violation node is selected.

- **Voltage Profile Graph:** this graph shows the voltage profile along the feeder representing voltage at each service point for before (displayed gray) and after (displayed blue) plan execution. This shows you the graphical voltage drop that occurs on the feeder and also shows you how the voltage profile will be raised or lowered at different sections as a result of implementing the plan.

  Note: The Voltage Profile Graph differs slightly for real-time usage and will overlay any bellwether meters voltages present. The before bellwether meters will be colored pink and the after bellwether meter voltages will be green.

- **Voltage Distribution Graph:** this graph displays the voltage distribution in the form of a frequency plot on the affected feeders. The before results are displayed in gray and after results in blue.

- **SCADA Measurements:** displays before and after measurements for SCADA telemetered devices within the optimization area. If the plan has not been executed, only the before values will display; once a plan is executed the after values will be populated. This table allow you to view loading and bellwether meter voltages before and after the optimization.

  If you select a row in the SCADA Measurements table, the right-click context menu provides options to open the SCADA Summary (**SCADA Summary...**) or view the selected device in the Viewer (**View...**).

Enabling and Disabling Optimization Devices from the Control Tool

You can enable or disable devices for Optimization actions by selecting either **Enable Optimization** or **Disable Optimization**, respectively, from the Control Tool's **Optimization...** button. These buttons are displayed for all optimization-capable devices. When a device is disabled from optimization, a condition flag is shown on the Viewer adjacent to the device.

Setting Optimization Mode on Feeders

You can set individual feeders to Automatic (Slow Cycle), Automatic (Fast Cycle), Manual (Slow Cycle), or Manual (Fast Cycle), or Disable mode with the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). However, the status of the other feeders on the same substation Load Tap Changer can influence the Optimization mode of the feeder.

AMI Bellwether Voltage

Overview

In real-time mode, Optimization is capable of making use of bellwether meter voltages. The voltages are used as an input to the optimization algorithm to ensure that voltage violations are not created on the secondary network serving customer meters. By using voltage telemetry, the Oracle Utilities Network Management System can begin to learn the difference between the solved power flow voltage versus the actual telemetered voltage and make estimates as to what the secondary service drop may be between a service transformer and the bellwether meter location. If utilities strategically choses bellwether meter locations at points that experience the lowest voltage on a feeder, it will help ensure that the optimization does not create voltage issues in scenarios like CVR where the voltage is lowered to reduce demand. Oracle recommends that utilities chose two to three metering points per regulation zone on a feeder. These voltages can come from field devices (sectionalizer, recloser, capacitor, and so forth) that are capable of telemetering voltage but would be most useful at customer meters.

Usage in Optimization

Before the Oracle Utilities Network Management System attempts to optimize an area of the network, it checks to see which bellwether meters have had voltages updates within a configurable time period (the default is 15 minutes) since only up to date telemetry will be utilized. Once the list has been received, if any of the telemetered voltage values differ by a configurable percentage from the power flow calculated voltages, the optimization will not be run in that area because there is either a severe power flow data issue or an issue with telemetry accuracy; in either case, the optimization will not be run since the results could have a negative impact on the performance of the feeder. Utilizing only the valid telemetered voltages, the secondary impedance drop is estimated at each of the bellwether locations and used as input into the optimization algorithm. For example, if the solved voltage at a meter is 95 percent of nominal and the telemetered is 94 percent of nominal, the Oracle Utilities Network Management System knows there is a one

percent discrepancy between actual and solved. Therefore, when running an objective (such as CVR), the algorithm will ensure that this difference is taken into account when ensuring a particular plan does not create low voltage conditions. The Oracle Utilities Network Management System captures a snapshot of the bellwether voltages before and after plan execution so you can review the results to determine the effectiveness of the plan and to assure you that low voltage conditions were not created.

Chapter 15

Load Shed & Restoration

This chapter covers the following topics:

- Introduction
- Understanding the Load Shed and Restoration Tool
- Using the Load Shed and Restoration Tool

Introduction

Load Shed and Restoration tool helps plan the load groups for load shed operations. It displays the pre-configured set of feeder load groups along with their rank to shed and their present status on the network. The rank for a load group is determined by when the feeders in the group were last used in a shed/restore scenario. Lower the rank value, higher the preference to shed the group. One or many groups can be selected for load shed operation and a load shed (switching) plan can be generated for the selected load groups.

Note: Load Shed and Restoration is used in real-time mode only.

Understanding the Load Shed and Restoration Tool

You can use the Load Shed and Restoration tool by logging into the Web Workspace with Web Switching with Administration privileges. Subscribe to the zones whose load groups you want to view in the Load Shed and Restoration tool.

To start the Load Shed and Restoration tool, select **Load Shed and Restoration** from the Web Workspace **Tools** menu; this option is only available when an Administration user is logged in.

Menu and Toolbar

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the Print dialog box, which allows to print the table data.	
Exit	Closes the Load Shed and Restoration Tool window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshed the load groups.	
View...	Open the Viewer with the selected device in focus.	
Get Impacted Customers	Generate and view a list of customers impacted by the load shed operation.	
Create Manual Switch Plan	Creates a new Load Shed switch plan.	
Open Switching Sheet	Opens the associated Load Shed switching sheet, if one exists.	

Help Menu

Menu Option	Description	Toolbar Icon
Load Shed and Restoration Help	Opens the online help system to the Load Shed and Restoration Help help content.	--

Selected Load Pane

The Selected Load pane contains values for the total **Configured Load, net load (Net PF Load), and DER output calculated from power flow (PF Gen)** for the load groups selected in the Load Groups pane.

Find Groups Pane

You can find load groups by specifying search criteria.

- **SCADA Only:** Select this check box to search only SCADA load groups. Otherwise, both SCADA and manual load groups will be searched.
- **Allow shedding of critical customers:** Select this check box to allow shedding of critical customers.
- **Feeders in nominal state only:** Select this check box to find groups with feeders in nominal state only.
- **Net load to shed (MW):** Specify amount of net load in MW to shed. Search button is enabled when the amount is specified.
- **DER Output less than (MW):** Specify DER output in MW. This field is displayed only when power flow is licensed.

When you click **Search**, the load groups matching the search criteria will be selected in the load groups table.

Load Groups Pane

The Load Groups pane displays the load groups configured in the zones you have subscribed to.

Load Groups Table

The load groups are displayed in a table with the following data columns:

- **Load Group:** Name of the group.
- **Type:** SCADA or Manual. If all the switches in the load group are SCADA enabled then the group is a SCADA group, otherwise it's a Manual group.
- **Rank:** Dynamic rank of the group to perform load shed. The lower the rank value, the higher the preference to shed the group. Rank changes based on the last shed and restore times of the group.
- **Select:** check box to select or deselect a group for the load shed plan.
- **Feeder:** Name of the feeders in the group.
- **Switch:** Name of the switch to open or close for load shed and restoration on the feeder.
- **Configured Load (MW):** Load configured for the feeder. At group level it is the sum of the configured load of energized feeders in the group.
- **PF Load (MW):** Load calculated from power flow. At group level it's the sum of the power flow calculated load of the feeders in the group. This is displayed only when power flow is licensed.
- **PF Gen (MW):** DER output calculated from power flow. At the group level, this is the sum of the power flow calculated DER output of the feeders in the group. This is displayed only when power flow is licensed.
- **# DERs:** Number of DERs connected to the feeder. At the group level, it is the sum of DERs of all the feeders in the group.
- **# Critical Customers:** Number of critical customers of configured types for load shed and restoration. At the group level, it is the sum of critical customers of all the feeders in the group.
- **Feeder Nominal:** Yes or No. **Yes**, if the feeder is in nominal state; otherwise, **No**. At the group level, if all the feeders in the group are in nominal state, then the value is Yes; otherwise, the value is No.
- **Feeder Status:** Status of the feeder (Energized or De-Energized).
- **Initial Priority:** Initial priority set for the group for load shed operation. This column is hidden by default. To display the column, right-click and select **Select Columns...** from the context menu, and then select the **Initial Priority** option.
- **Plan #:** Load Shed switch sheet plan number that contains the load group.
- **Plan Status:** Current status of the Load Shed switch sheet that includes the load group.
- **Last Shed Time:** Time when the load group was last shed.
- **Last Restore Time:** Time when the load group was last restored.

Selecting Columns to View

Right-click the table header cells and select the **Select Columns...** option. The Select Columns to Display dialog box will open that lists each of the column and allows you to select or deselect a column to view.

> **Note:** You may rearrange columns by dragging them to the desired position.

Locking Columns

You may lock columns to keep them in view. When columns are locked, a horizontal scroll bar will appear allowing you to scroll to see the remaining columns. To lock columns, right-click the column furthest to the right that you wish the lock; the horizontal scrollbar will appear for all columns to its right.

Using the Load Shed and Restoration Tool

Create a Load Shed Plan

1. To create a Load Shed switching plan, select one or more load group rows in the Load Groups table.
2. Click **Create a Manual Switch Plan**. A new Load Shed switching plan is generated with the switches of the selected load groups. The load shed plan number and its status are displayed against the selected load groups.
3. In the switch sheet, execute the steps.

   A real outage event is created when a device is operated from a load shed switching sheet. The event will be displayed with Out-LoadShed in the Clues field and LoadShed plan number in the Plan # field.
4. Refresh the Load Shed and Restoration tool to see the last shed and restoration times against those devices. The rank of the load groups is also updated.

   Note: A group can participate in only one Load Shed plan at any time. Only energized feeders will be part of a new load shed plan.

   To see the list of impacted customers, click the **Impacted Customers** button ( ).
5. Click the **Refresh** button ( ) to get latest information of the load groups.
6. Click the **Focus** button to ( ) focus on the switch for the selected feeder.

Automatic Execution of SCADA Load Shed Steps

From the Switching Sheet Editor window's Steps tab, click the **Execute all SCADA Load Shed Steps** button ( ). All SCADA switch steps will be executed after prompting for confirmation. Note that separate isolation sequences will be executed in parallel. While the switching sheet steps are being executed, the switching sheet will be placed in View Only mode. Once the automatic execution of isolation steps has completed, restoration steps may be manually executed.

Note: The automatic execution of isolation sequences is based on the load group/block type. Any SCADA switch steps that are manually added under Load Shed - SCADA blocks are automatically executed upon clicking this button.

Deleting a Load Shed Plan

A load shed plan can be deleted before the sheet status changes to **In Progress**.

Chapter 16

DERMS Dashboard

This chapter covers the following topics:

- Understanding the DERMS Dashboard
- Understanding Network Capacity Allocation

Oracle Utilities Network Management System's DERMS (Distributed Energy Resource Management System) Dashboard provides information related to distributed energy resources (DERs) connected to an electric distribution system. This information can be used to better assess the amount of current DER contribution, as well as the forecasted DER contributions.

> **Note:** Feeder Load Management must be installed and configured for data population in the DERMS Dashboard.

The DERMS Dashboard provides high level and detailed forecast information broken out by different DER technology types (for example, PV, Wind, Gas, and so on).

Understanding the DERMS Dashboard

The DERMS Dashboard provides a tabbed user interface containing summary and forecast information related to DERs for an electrical distribution system. It is accessed by selecting **DERMS Dashboard...** from the Web Workspace **Tools** menu.

Menus and Toolbar

The DERMS Dashboard window has the following menu and toolbar options.

File Menu

Menu Option	Description	Toolbar Icon
Print	Prints the DERMS Summary tab information.	
Exit	Closes the DERMS Dashboard window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
View	Focuses the Viewer on the selected DER unit.	

Understanding the DERMS Summary Tab

The **DERMS Summary** tab displays high level information related to the system, weather zones, and large scale utility DERs. All of the information is based on real-time conditions and current output of all resources. It is meant to provide as a quick reference overview broken down by technology types that are currently having an impact on the system. This tab contains three tables that display the following information:

- The **System Summary** table contains the current output (MW and MVAr) for each technology type of DER, the current total DER output, the total generation capacity (MVA), and the current total load for the entire distribution system.
- The **Weather Zone Summary** table displays the current output (kW and kVAr) of each weather affected DER technology type for each weather zone. It also has a column for the total output and generation capacity (kVA) for the weather zone that sums the various technology types present.
- The **Utility DER Summary** table displays the current output (kW and kVAr) of the individual DER units that do not belong to a weather zone (for example, utility scale gas generators or batteries). This table will also show the generation capacity (kVA) of the unit.

System Summary Table

- **Wind (MW/MVAr):** The total wind generation on the system in MW and MVAr.
- **PV (MW/MVAr):** The total photovoltaic (PV) generation on the system in MW and MVAr.
- **Fuel (MW/MVAr):** The total fuel generation on the system in MW and MVAr.
- **Battery (MW/MVAr):** The total battery generation on the system in MW and MVAr.
- **Total Generation (MW/MVAr):** The total generation of all DER technology types summed together in MW and MVAr for the system.
- **Generation Capacity (MVA):** The total generation capacity of all DER technology types summed together in MVA for the system.
- **Total Load (MW/MVAr):** The total demand on the system from loads.

Weather Zone Summary Table

- **Weather Zone:** The name of the weather zone.
- **Wind (kW/kVAr):** The total wind generation in kW and kVAr for the weather zone.
- **PV (kW/kVAr):** The total Photovoltaic (PV) generation in kW and kVAr for the weather zone.
- **Fuel (kW/kVAr):** The total fuel generation in kW and kVAr for the weather zone.
- **Battery (kW/kVAr):** The total battery generation in kW and kVAr for the weather zone.
- **Total Generation (kW/kVAr):** The total generation of DER technology types summed together in kW and kVAr for the weather zone.
- **Generation Capacity (MVA):** The total generation capacity of all DER technology types summed together in MVA for the weather zone.

Utility DER Summary Table

- **Resource Name:** The name of the utility scale DER (for example, Large Battery or Diesel Generator).
- **Substation:** The substation the DER is a part of.
- **Feeder:** The feeder the DER is connected to.
- **Power Source:** The technology type associated to the unit (for example, Battery, Fuel, Hydro, and so on).
- **Islandable:** Indicates if the DER is capable of islanding an area of de-energized network.
- **Capacity (kVA):** The generation capacity of the unit in kVA.
- **Output (kW/kVAr):** The total output of the resource in kW and kVAr.
- **Availability Price ($/MWH):** The availability pricing in $/MWH for the DER unit.
- **Utilization Price ($/MWH):** The utilization pricing in $/MWH for the DER unit.
- **Solution Time:** The time the solution was last solved for this particular DER.
- **NCA Status:** Displays the Network Capacity Allocation Status if the DER is setup as a market participant. This will specify if the bid is accepted, denied, or curtailed.

Understanding the Weather Zone Forecasts Tab

The **Weather Zone Forecasts** tab allows you to see weather zone forecast information for a selected zone. With this information, you can see the forecast data (provided via an external weather service and/or the DERMS system via an adapter to NMS), and the current and forecasted output (kW, kVAr) for each DER technology type. The following information is available in the **Weather Zone Forecasts** tab:

- Date/Time
- Temp (F)
- Wind Speed (mph)
- Cloud Cover
- Wind Output (kW/kVAr)
- PV Output (kW/kVAr)
- Fuel Output (kW/kVAr)
- Battery Output (kW/kVAr)
- Total Generation (kW/kVAr)

The **Weather Zone Forecasts** tab shows information related to a specific weather zone. The forecast information displayed is for the real time output and configured forecast range. It is meant to show how DER output can change based on upcoming weather trends and forecasted conditions. For example, if the current day is supposed to transition to a cloudy day with no wind, you will be able to see how the forecasted PV and wind output begin to decrease as conditions start to change.

You can navigate to the **Weather Zone Forecast** tab in two ways:

- Select the **Weather Zone Forecasts** tab. Once the tab has opened, you need to select the zone you are interested in from the **Weather Zone** drop-down list.
- Select a weather zone row in the **DERMS Summary** tab's **Weather Zone Summary** table, right-click, and select **View Forecast...** from the context menu. The **Weather Zone Forecasts** tab will open with the selected zone forecast displayed.

Weather Zone Forecasts Table

- **Date/Time:** The date and time for the row of forecast and weather data that is displayed.
- **Temp (F):** The forecast temperature for the weather zones forecast date/time.
- **Wind Speed (mph):** The forecast wind speed for the weather zone forecast date/time.
- **Cloud Cover:** The forecast cloud cover level for the weather zones forecast date/time.
- **Wind (kW/kVAr):** The total forecasted wind generation in kW and kVAr for the weather zones forecast date/time.
- **PV (kW/kVAr):** The total forecasted Photovoltaic (PV) generation in kW and kVAr for the weather zones forecast date/time
- **Fuel (kW/kVAr):** The total forecasted fuel generation in kW and kVAr for the weather zones forecast date/time.
- **Battery (kW/kVAr):** The total forecasted battery generation in kW and kVAr for the weather zones forecast date/time.
- **Total Generation (kW/kVAr):** The total forecasted generation of DER technology types summed together in kW and kVAr for the weather zones forecast date/time.

Understanding the Utility DER Forecast Tab

The **Utility DER Forecasts** tab allows you to see Utility Scale DER forecast information for a selected resource. With this information, you can see the forecasted output (kW, kVAr) of the resource that has been provided via an external DERMS system via an adapter to NMS.

The forecast information displayed is for the real-time output and configured forecast range. It is meant to show you how DER output can change based on the forecast data provided for the resource (for example, battery used for peak shaving).

You can navigate to a specific Utility DER Forecast in two ways:

- From the **DERMS Summary** tab:
  - Select the resource you are interested in from the **Utility DER Summary** table. Right-click and select **View Forecast…** from the context menu. The DERMS Dashboard window will display the **Utility DER Forecasts** tab with the selected resource name populated in the **Resource Name** field, and with the resource's forecast data displayed in the **Utility DER Forecast** table.
- From the **Utility DER Forecast** tab:
  - Select the resource you are interested in from the **Resource Name** drop-down list. The **Utility DER Forecasts** table will be populated with the selected resource's forecast data.

The **Utility DER Forecasts** tab will also show information related to Network Capacity Allocation (NCA) if the device is configured as a market participant DER and bidding into the day ahead market. The NCA Forecast information will be displayed on a table

within this page and represent the results of the analysis stating for each configured forecast interval the bid status of the unit and its recommended output.

Utility DER Forecasts Tab Layout

The top section contains the following information:

- **Resource Name:** The name of the utility scale DER (for example, Large Battery or Diesel Generator).
- **Substation:** The substation the DER is a part of.
- **Feeder:** The feeder the DER is connected to.
- **Power Source:** The technology type associated to the unit (for example, Battery, Fuel, Hydro, and so on).
- **Islandable:** Indicates if the DER is capable of islanding an area of de-energized network.
- **Market Participant:** Specifies if this DER is bidding into the day ahead market and is consider in the Network Capacity Allocation Analysis.
- **Aggregator:** Displays either **`Y`** or **`N`** if the DER belongs to an aggregator or not.
- **Capacity (kVA):** The generation capacity of the unit in kVA.

Utility DER Forecasts Table

The Utility DER Forecasts table contains the following information:

- **Date/Time:** The date and time for the row of forecast data that is displayed.
- **Output (kW/kVAr):** The forecasted total output of the resource in kW and kVAr
- **Solution Time:** The time the solution was last solved for this particular DER.

Network Capacity Allocation Forecasts Table

The Network Capacity Allocation Forecasts table specifies the results of the Network Capacity Allocation (NCA) analysis and displays the bid status and recommended output for each forecast interval. See section **Understanding Network Capacity Allocation** on page 16-9 for more information.

- **Date/Time:** The date and time the NCA analysis row corresponds to.
- **Proposed Output (kW/kVAr):** The total output in kW and kVAr the generator wanted to bid into the market.
- **Allowed Output (kW/kVAr):** The total output in kW and kVAr the generator can produce as determined by the NCA analysis. If the generator exceeds the allowed output flow constraints will be created on the network.
- **Price ($/MWH):** The price of generation for this particular interval as provided with from the generator with the bid.
- **Bid Status:** The bid status for this NCA analysis interval; the values may be `Accepted`, `Denied`, or `Curtailed`. For example, if the NCA analysis determined the generator cannot produce any power during this interval without creating flow constraints, the **Bid Status** would be set to `Denied`. If the generator output needed to be reduced from the proposed output, but not fully reduced, the bid status would be `Curtailed`. If the proposed generator output does not create any flow constraints and can be fully utilized, the bid status will show as `Accepted`.

Viewing Violations for a NCA Forecast

When viewing the NCA forecast for a particular DER, the flow and/or voltage violations that caused curtailment can be displayed. You can view these issues for each forecast hour. Right click the forecast of interest, and then select **View Violation...**. When the Network Capacity Allocation Violation dialog box opens, you can then select the option to view the **Proposed** or **Allowed** violations. The **Proposed** violations correspond to issues that would occur with the proposed generator output, this is essentially the output the generator intended to supply. The **Allowed** violations correspond to issues that would occur with the NMS recommended generator plan, under ideal circumstances the number of allowed violations should be zero. The following columns will be displayed in the NCA Violation dialog box.

- **Device:** The device name where the violation has occurred.
- **DER Name:** The DER name that has sensitivity to the violation.
- **Feeder Name:** The name of the feeder where the violation has occurred.
- **Violation:** The type of violation that has occurred (for example, Switch Overload, Conductor Overload).
- **Phase:** The phase on which the violation has occurred
- **Value:** The power flow value on the device (for example, amps for switches/ conductors, kV for voltage issues).
- **%:** The percent overload of the violation
- **Limit:** The limit on the overloaded device
- **Pre-Existing Viol:** Specifies if this was a pre-existing violation that existed before any generator schedules were taken into account.

Understanding Network Capacity Allocation

The Network Capacity Allocation (NCA) analysis will determine based on submitted forecasts how much generation can be offered for a 24 hour period without creating network congestion or voltage problems. Currently with the number of DER units that are being added to the distribution network situations can arise that create congestion and/or voltage issues on the system if all DER resource were contributing power at the same time. The NCA analysis will run ahead of time to determine based on generation schedules submitted by the generators problems will arise. If it is determined that issues will be created the NCA analysis will begin curtailing units that are capable of relieving issues. The analysis will look at the highest cost unit and begin curtailing that unit first. If the curtailment relieves the violations, no other units will be curtailed if the analysis determines the issue is still present the next highest cost unit will be curtailed, the analysis will continue until all units have been curtailed or violations eliminated. When generating solutions for the analysis each hour will be evaluated independently such that a unique set of generation values will be generated for each hour. The analysis can be setup to either consider or ignore pre-existing conditions. If a feeder is setup to ignore pre-existing conditions it will discard any congestion or voltage issues that existed before the generation schedules were taken into account. For example, if a feeder has a flow constraint without any market participant DERs being taken into account that specific constraint issue will be ignored when the analysis is run. If a feeder is setup to consider pre-existing conditions all violations will be considered such that if anything is made worse by the forecast schedules for the DER units the units will begin being curtailed to relieve any possible issues.

Data Requirements for Network Capacity Allocation

To enable the Network Capacity Allocation (NCA) analysis the following pieces of data and configuration will need to be set up:

- SRS rule `ENABLE_NCA_ANALYSIS` will need to be configured with a value of **`yes`** to enable the functionality, by default this rule is set to **`no`**. Once enabled, the analysis will run daily at the time configured by SRS rule `NCA_ANALYSIS_START_TIME`.
- Any DER units that should be considered within the analysis will need to be marked accordingly. This is specified in column MARKET_PARTICIPANT in table PF_DIST_GEN using either **`Y`** or **`N`**.

The following table will need to be populated with a project defined process or adapter. This table is used to store the forecast output and pricing information for each DER unit participating in the NCA analysis. The table will hold information on an hour by hour basis to represent the output levels the generator plans to operate at and the pricing information the power can be produced at for that same hour. This data will be used as inputs into the analysis to determine if all proposed generation will create congestion issues on the network. The pricing information will be used to determine which generator to curtail first.

Column	Required	Comments
RESOURCE_NAME	Y	The name of the DER unit Note: This needs to map to the same name populated in column GEN_NAME within table PF_DIST_GEN
ALTERNATE_NAME	N	An alternate name for the DER unit
FORECAST_DATETIME	Y	The date and time for the forecast for the DER corresponds to
PRICE	Y	The price in $/MW that power can produced at for the corresponding date and time
KW_FORECAST	Y	The forecast kW for the DER unit
KVAR_FORECAST	Y	The forecast kVAr for the DER unit

Chapter 17

Feeder Load Management

This chapter covers the following topics:

- Overview
- Feeder Load Management Modes
- Using the Feeder Load Summary
- Using the Feeder Load Management Window
- Using Real-Time and Study Mode
- Data Source and Data Quality
- Using the DMS Summary

Overview

Feeder Load Management (FLM) allows you to manage energy delivery in the electric distribution system and identify problem areas. FLM monitors the vital signs of the distribution system and identifies areas of concern so that the distribution operator is forewarned and can efficiently focus attention where it is most needed. It allows for more rapid correction of existing problems and enables possibilities for problem avoidance, leading to both improved reliability and energy delivery performance.

FLM is cyclically executed and automatically triggered by pertinent changes in the electric distribution system, such as increased demand, change in measured values reported by SCADA, or switch status changes. FLM uses a combination of SCADA derived scaling factors, load profiles, temperature, distributed generation profiles, and a globally supplied scaling factor to predict load for future forecasting.

FLM is capable of solving feeders using both a full power flow solution as well as using a less data intensive kVA solution. FLM will automatically determine which type of solution to run based on the feeder configuration. In the event that two feeders are tied together with one being configured for a kVA solution and the other for a Power Flow solution, the analysis will default to using a kVA solution. Please see **Power Flow Solution Types and Frequency** on page 12-2 for more information related to solution types.

> **Note:** FLM will use SCADA supplied scaling factors (in addition to load profile data) for a configurable period of time before transitioning to

using global scaling factors. FLM uses a linear transition between the SCADA scaling factor and the global scaling factor.

Feeder Load Management tools are dynamically updated after each FLM execution, which may be performed periodically (provided SCADA reports a change in measured values) or in response to changes in the electrical network (for example, a.switch is opened or closed). Time between FLM periodic executions, as well as other FLM execution parameters, is configurable. Administrative users can view or change these settings using the Configuration Assistant's Event Management Rules tab (see **Using the Event Management Rules Tab** on page 24-16).

The **Feeder Load Summary** tool provides dynamically updated views of closest-in-time alarms, worst case loads, and present loads of all feeders. From the Feeder Load Summary, you may drill down to those feeders where capacity margins and/or device limits are at risk or violated using the Feeder Load Management window.

The **Feeder Load Management** window provides load summaries, as well as Device Violations, Feeder Load Details, Tie Points Capacity Overview, Transformers, Shunted Devices, and Equivalent Sources Details. You can initiate Feeder Load Management calculations in Study Mode with different load scale factors and topology to predict selected feeders performance for different switching scenarios.

Note: If a customer has implemented Power Flow without an FLM license, certain components of both the Feeder Load Summary and Feeder Load Management user interfaces will still be enabled. This allows you to see results of the real-time power flow solution, but no forecast solutions (since a FLM license is required for forecasting ability). You will have access to the following features:

- Feeder Load Summary Present Loads View.
- Feeder Load Management will display one solution of the real-time power flow solve (no FLM study options will be present).
- The Feeder Load Management Details will be present for the real-time solution.

Feeder Load Management Modes

The Feeder Load Management mode is set from the Web Workspace **Tools** by selecting **DMS Settings**, and then selecting an **FLM Status** (**Disabled** or **Enabled**). If you select **Disabled**, FLM will only show the real-time load information; if you select **Enabled**, FLM will forecast the loads for all the feeders.

Notes: changes to the FLM status are system wide.

FLM modes can be set for individual feeders with the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). A feeder can be in one of the following modes:

- **Forecasting Mode:** FLM will forecast the load scenario of the individual feeder.
- **Custom Forecasting Mode:** FLM performs power flow forecasts of islands in regular cycles. This custom mode helps to configure conditions on a feeder, which will determine whether the feeder is eligible to perform forecast or not in the next forecast cycle. The feeder will be eligible to perform forecast when at least one condition is matched among the configured conditions.

  Note: These conditions are configured with the FLM Custom Forecasting SRS rule using the Configuration Assistant. The conditions are:

  - When a feeder head loads changes by X kW compared to its previous cycle solve (where X refers to configurable value).
  - When the last forecasted time on a feeder exceeds by Y hours (where Y refers configurable hours).
  - When a device on a feeder, which belongs to a forecast device group, changes its settings/status. Device groups are configured via FLM_FORECAST_DEVICE_GROUPS database table.

  It also performs the solution at a configurable custom granularity and for the custom period, which can be set in the FLM Custom Forecasting SRS rule.
- **Real-Time Mode:** FLM only show the real-time load information.
- **Disabled Mode:** FLM will not show any information about this feeder.

In effect, the minimum of the system-wide FLM mode and individual feeder FLM mode will be displayed.

Using the Feeder Load Summary

The Feeder Load Summary, available from the Web Workspace **Tools** menu, provides an overview of feeder performance. The data shows closest-in-time alarms, worst case loads, and present loads of all the feeders within your subscribed control zone authority.

Menus and Toolbar

The Feeder Load Summary window provides the following menu and toolbar options.

File Menu

Menu Option	Description	Toolbar Icon
Print...	Prints the Feeder Load Summary table.	
Export FLM History...	Exports Measurement and Verification data into a file.	--
Toggle Dockable Window	Changes a standalone window to a pane that may be moved or docked in another window or frame. See **Understanding Docked Panes and Standalone Window Tools** on page 2-13 for more information on dockable and standalone windows.	--
Exit	Closes the Feeder Load Summary window.	--

Actions Menu

Menu Option	Description	Toolbar Icon
View...	Focus the Viewer on the selected feeder.	
Feeder Load Management Tool...	Opens and/or updates the Feeder Load Management Tool window. This button is disabled until you select rows in the Feeder Load Summary table with available FLM data. If multiple rows are selected, the Feeder Load Management window displays details for multiple feeders.	
Show Errors and Statistics...	Displays the FLM Feeder Errors, Warnings, and Details dialog box that displays model warnings and errors for the selected feeder solution. See **Feeder Errors and Warnings** on page 17-10 and **Using Power Flow Solution Details Window** on page 12-20 for details.--	--
Re-enable Island	The Re-enable Island action is enabled for Administration users when selecting a row with a Non-Convergent, Inconclusive, or Solution Failed. The action tells PFService to attempt to solve the island for the next forecast. **Note:** This action is also available from the right-click context menu.	--

View Menu

Menu Option	Description	Toolbar Icon
Earliest Alarms	The *Earliest Alarms* list shows closest in time problems for each feeder. The list is sorted by the **Date/Time** column showing earlier problems first. If a feeder does not have any violations or warnings in the next 6 days, it will not be presented in the list.	**See note.**
Worst Case	The *Worst Case* list shows worst Feeder Condition for each feeder in the next 6 days. The list is sorted by the score showing worse problems first.	**See note.**
Present Loads	The *Present Loads* list shows the current loads, sorted by score.	**See note.**

Note: The view options may be selected from the drop-down list on the toolbar

Help Menu

Menu Option	Description	Toolbar Icon
Feeder Load Summary Help	Launches online help for Feeder Load Summary.	--

Status Bar

The Feeder Load Summary window status bar displays the user type: Administration, Full Operations plus Switching, or View Only.

The Administration user's status bar provides access to the resolve and re-forecast function.

The resolve and re-forecast ( ) starts a new Feeder Load Management calculation. If a calculation is already in progress, the system will return a message that a forecast is in progress and that changes will be reflected in the next solution, which will begin immediately after the in-progress calculation is completed.

Understanding the Feeder Load Summary Data Table

The Feeder Load Summary window displays a table shows a list of feeders and their conditions and attributes. By default, the Earliest Alarms view is displayed. Other available views are **Worst Case Loads** and **Present Loads**. To switch between views, select the desired option from the **View** menu or from the drop-down list in the toolbar.

Feeder Load Summary Filter Pane

The Feeder Load Summary provides the following standard Global filters:

Filter Name	Description
All	Show all feeders.
Violations Only	Show only feeders with violations.
Violations and Warnings	Show only feeders with violations or warnings.

Notes:

The Feeder Load Management Summary table also supports Quick Sorting, Dynamic Filtering, and Auto Filtering.

Feeder Load Summary Table Columns

The Feeder Load Management Summary table displays the following columns.

- **Substation:** The substation name.
- **Feeder:** The feeder name. This column displays a yellow background for feeders with abnormal data quality or/and data source for any of the phases. See **Data Source and Data Quality** on page 17-36 and **Feeder/Device Condition Names and Colors** on page D-7 for more details.
- **Feeder Condition:** Violation or warning (if any) on a feeder. When multiple violations/warnings occur on a feeder, this column shows the highest-level violation. See **Feeder Conditions** on page 17-8 for more information.
- **Date/Time:** Date and time for the displayed feeder condition.
- **Phase:** The phase with the maximum capacity utilization.
- **Util %:** Feeder head utilization capacity.
- **Amps:** Electrical current on the phase with the maximum capacity utilization.
- **kW:** Active power on the phase with the maximum capacity utilization. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVAr:** Reactive power on the phase with the maximum capacity utilization. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVA:** Apparent power on the phase with the maximum capacity utilization.
- **kV:** Voltage on the phase with the maximum capacity utilization.
- **Updated:** Date and time of the last update for the feeder (only for Earliest Alarms and Worst Case Loads Views).

- **Score:** EDA score of the feeder at the time of the condition.
- **# Alarms:** Total number of alarms on the feeder at the time.
- **PF Mode:** The type of solution used to solve the feeder (kVA or Power Flow).
- **FLISR:** The mode that FLISR is set to (Disabled, Manual, Automatic).
- **FLM:** The FLM status for the feeder (Forecasting, Real-Time, Disabled).
- **Optimization:** The Optimization status (Enabled, Disabled).
- **FLA:** The mode that FLA is set to (Enabled/Disabled).
- **Optimization Objective:** The objective for Optimization (Loss Minimization, Conservation Voltage Reduction, Power Factor Correction, or None).
- **Protection Schemes:** Displays whether dynamic protection schemes are disabled or in manual or automatic mode.
- **Protection Schemes Mode:** Displays whether protection scheme steps appear before or after the restoration switch step in Suggested Switching and FLISR switching plans.
- **Feeder Type:** the feeder type.
- **PF History:** the status of PF History (Enabled/Disabled).

Data Source and Quality Information Balloon

The data source and data quality balloon ( )displays feeder head data source and data quality information for the selected row. See **Data Source and Data Quality** on page 17-36 for more information.

Feeder Conditions

Feeder Load Management displays feeder conditions, including warning and violations, in the **Feeder Condition** columns of the Feeder Load Summary and the Feeder Load Management Tool. Feeders that present no abnormal conditions at all are reported as *Normal*.

Abnormal Conditions

Abnormal conditions fall into 3 categories:

- **Warnings:** These conditions represent situations on the feeder when a device is approaching a limit. For example, the *High Voltage Warning* indicates that a distribution supply transformer is close to exceeding the (configured) upper limit.
- **Violations:** These conditions represent situations on the feeder when a device has breached a limit. For example, the *High Voltage Violation* indicates that a distribution supply transformer has exceeded the (configured) upper limit.
- **Errors:** These conditions represent the inability of the power flow engine to achieve a result.

Warnings and Violations

Warnings and Violations have the following categories:

- **Backfeed:** A device has been detected to have real power flow in the reverse direction.
- **Under Voltage:** A device's voltage is at the low end of permissible operation
- **Over Voltage:** A device's voltage is at the high end of permissible operation
- **Switch Overload:** The current flowing through a switch is close to (or exceeding) rated value
- **DistTrans Overload:** The power flowing through a distribution transformer is close to (or exceeding) rated value
- **Feeder Capacity:** The current flowing through a Feeder Head Breaker is close to (or exceeding) rated value
- **Conductor Overload:** The current flowing through a conductor is close to (or exceeding) rated value.
- **Unprotected Ground Violation:** The device is not adequately protected from ground faults by the upstream protective device.
- **Ground Reach Violation:** The protective device does not provide adequate protection for ground faults on at least one downstream device.
- **Unprotected Phase Violation:** The device is not adequately protected from phase/line faults by the upstream protective device.
- **Ground Phase Violation:** The protective device does not provide adequate protection for phase/line faults on at least one downstream device.
- **PowerTrans Overload:** The current flowing through a Substation Transformer is close to (or exceeding) rated value.
- **DistGen Time-to-Live (TTL)**: The distributed generator time to live is expected to expire (or has already expired) indicating the unit is close to running out of fuel/charge or already has.
- **DistGen Overload:** The distributed generator sustaining a section of the network in island mode is overloaded.
- **Model Error:** A device is determined to have invalid data attributes prior to attempting power flow solutions
- **Inconclusive:** The power flow engine could not converge on a solution. The solution details may give more information about the failures.
- **Inconclusive SCADA:** The feeder is an electrical island that contains a suspect SCADA related feeder. This means there is some question about the integrity of the results island-wide.
- **Suspect SCADA:** The data from SCADA can't be matched to a power flow solution. This could mean that a device in the field has changed state and the NMS is unaware. There could be modeling or SCADA issues.
- **Solution Failed:** The power flow engine diverged from a stable solution. This indicates a problem with the electrical model, for example an incorrect attribute or connection on a service. The solution details will give more information about the failures and identify the area where the problem occurs.

- **Inconclusive Solution:** The power flow engine could not converge on a stable solution. That is, after the configurable number of iterations had been reached, the engine was still finding significant discrepancies. This indicates a problem with the electrical model, for example an incorrect attribute or connection on a service. The solution details will give more information about the failures, and identify the area where the problem occurs.
- **Neutral Current Overload:** The current flowing through a neutral conductor is close to (or exceeding) rated value.
- **Voltage Angle Violation:** The difference in phase angles on the two sides of the open switch exceeds the configured limit.

Conditions Coloring

The Feeder Conditions column uses the following color-coding:

- **Red:** Violations Exist
- **Yellow:** Warnings Exist
- **Green:** No Warnings/Violations Exist.

See **Feeder/Device Condition Names and Colors** on page D-7 for a list of feeder/device conditions and their corresponding cell and text coloring.

Feeder Errors and Warnings

The Feeder Errors and Warnings dialog box lists specific device errors and warnings for each feeder that may prevent the system from solving power flow solutions.

1. Select a row in the Feeder Load Summary.
2. Select **Show Errors and Statistics...** from the Feeder Load Summary Actions menu. The Feeder Errors and Warnings dialog box will open.

The Feeder Errors and Warnings table displays the following information:

- **Feeder:** the name of the feeder with possible model errors or warnings.
- **Device**: the name of a device on the feeder with possible model errors or warnings.
- **Severity**: the error or warning type.
- **Message**: the error or warning message returned.

3. You may inspect a listed device's attributes and connections by selecting a row and clicking the Viewer focus button () and then launching Device Details (see **Displaying Device Details** on page 2-58).

Using the Feeder Load Management Window

The Feeder Load Management window provides detailed information about feeder loads, device violations and warnings, tie points capacity, and regulation devices. It supports real-time and study mode.

This section includes the following topics:

- Accessing the Feeder Load Management Window
- Features of the Feeder Load Management Window
  - Graphical View Tab
  - Feeder Load Overview Tab
  - Forecast Accuracy Tab
- Viewing and Modifying Study Session Parameters
- Requesting a New Feeder Load Management Calculation

Accessing the Feeder Load Management Window

You can open the Feeder Load Management window from the Viewer or from the Feeder Load Summary window.

From a Viewer

To open the Feeder Load Management window from a Viewer, select **Feeder Load Management...** from the Viewer's **Tools** menu or click the Feeder Load Management button ( ) on the Viewer toolbar.

The Feeder Load Management mode is defined by the Viewer's mode.

> **Note**: Feeder Load Management can be disabled for some of the feeders using the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details).

From the Feeder Load Summary Window

From the Feeder Load Summary window, you can open the Feeder Load Management window for a single feeder or for multiple feeders.

- To open the Feeder Load Management window for a single feeder, double-click the corresponding row in the Feeder Load Summary table or right-click the row and select **Feeder Load Mgmt Tool** or **Feeder Load Mgmt Tool 2** from the context menu.
- To open the window for multiple feeders, select the corresponding rows in the Feeder Load Summary Table and click the Feeder Load Management button ( ).

The Feeder Load Management window opens in real-time mode. Once the window is open, you can switch modes by clicking the corresponding button on the toolbar.

> **Note**: The system allows you to have two open Feeder Load Management Tools at any time. Multiple Feeder Load Management Tools can be used to compare the details for different feeders.

Features of the Feeder Load Management Window

The Feeder Load Management window is used to view detailed information about feeder loads, device violations and warnings, tie points capacity, and regulation devices. You can initiate Feeder Load Management calculations in Study Mode with different load scale factors and topology to predict selected feeders' performance for different switching scenarios.

The Feeder Load Management window displays a pull-down menu, toolbar, status bar, and two views. It has two modes: study and real-time. Each of these features is described in the sections that follow:

- Menus and Toolbar
- Status Bar
- Graphical View Tab
- Feeder Load Overview Tab
- Forecast Accuracy Tab
- Feeder Load Management Details
- Using Real-Time and Study Mode
- Viewing and Modifying Study Session Parameters
- Requesting a New Feeder Load Management Calculation
- Selecting Columns to Display in the Table or Additional Columns Balloon
- Data Source and Data Quality

Menus and Toolbar

The Feeder Load Management window provides the following pull-down menu options and toolbar options.

File Menu

Menu Option	Description	Toolbar Icon
Exit	Closes the Feeder Load Management window.	

Actions Menu

Menu Option	Description	Toolbar Icon
Real Time	Switches to real-time mode. (This option is desensitized if Real-Time Mode is active.)	
Study Mode	Switches to study mode. (This option is desensitized if Study Mode is active.)	
Study Session for Selected Row Profile	Launches a Power Flow Study Session in the viewer based on the conditions for selected row. The same forecast parameters for generation and loading will be utilized when setting up the load scenario in the Viewer. Users may utilize this option if a more detailed analysis needs to be conducted on the network for a future date and time.	
Show Errors and Statistics...	Displays the FLM Feeder Errors, Warnings, and Details dialog box, which displays model warnings and errors for the selected feeder solution. See **Feeder Errors and Warnings** on page 17-10 and **Using Power Flow Solution Details Window** on page 12-20 for details.	
Re-enable Island	The **Re-enable Island** action is enabled for Administration users when selecting a row with a Non-Convergent, Inconclusive, or Solution Failed. The action tells PFService to attempt to solve the island for the next forecast. **Note:** This action is also available from the right-click context menu.	--

Options Menu

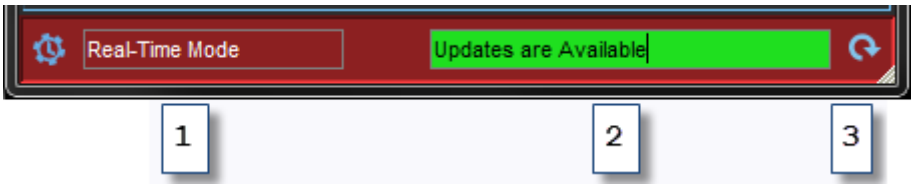
Menu Option	Description	Toolbar Icon
Power Flow Options...	Allows you to configure Real-Time Power Flow Options if you are in real-time mode. If you are in Study Mode, click this button to configure Study Mode Load Scenario.	
Select Columns...	Opens the Select Columns to Display dialog box for you to select which columns you want to appear in the table on the Feeder Load Management Feeder Load Overview tab. If a column is not checked, it will be displayed in the Additional Columns balloon details window rather than on the main window.	--

Help Menu

Menu Option	Description	Toolbar Icon
Feeder Load Management Help	Opens the online help system to the Feeder Load Management tool help content.	--

Status Bar

The status bar displays at the bottom of the Feeder Load Management window.

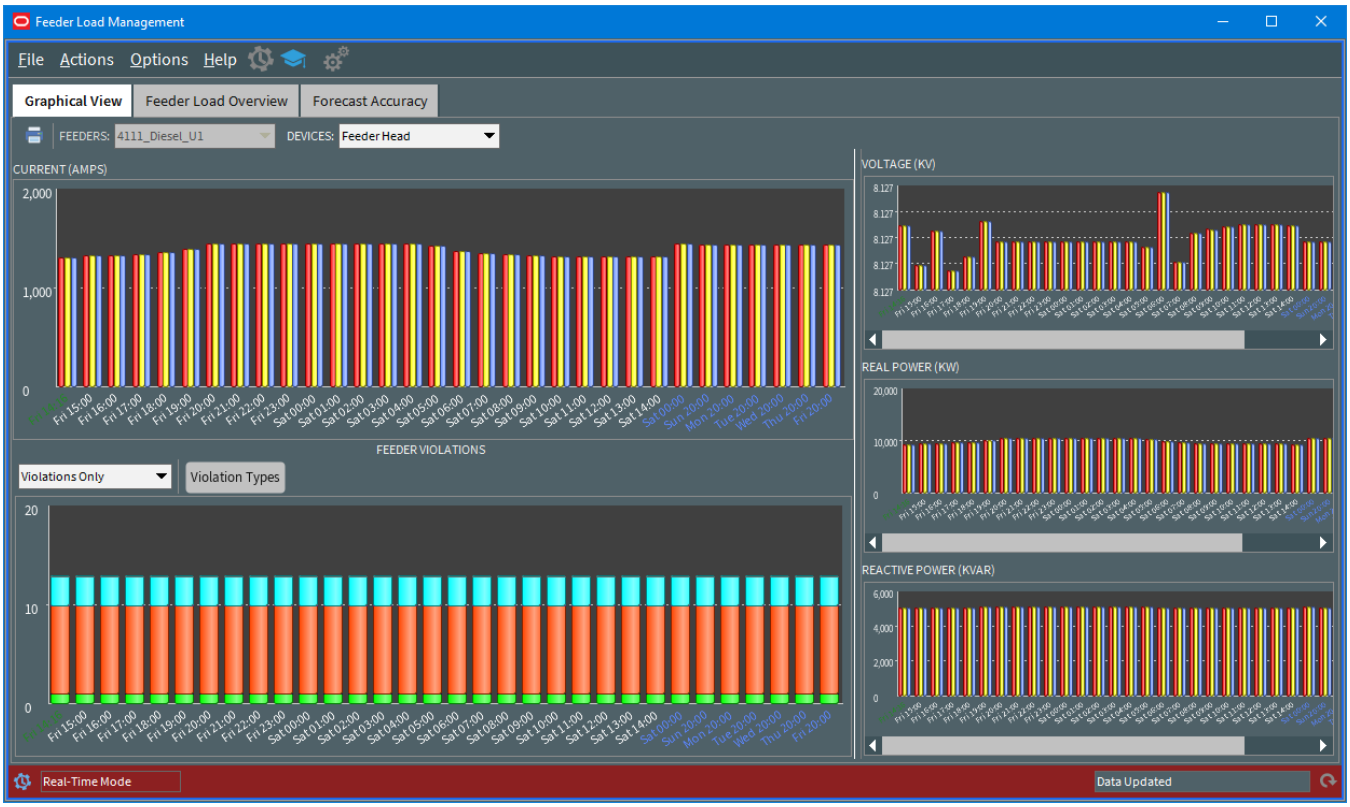


It provides the following information and functions:

1. Real-time or study mode indicators.
2. Indicates if data has been updated.
3. **Refresh** button ( ).

Graphical View Tab

The **Graphical View** tab is active when you initially start the Feeder Load Management tool. The Graphical View allows you to quickly see the trends in the forecasted data.



Use the **Feeder** option menu to display data for a different feeder, if the Feeder Load Management Tool is showing results for more than one feeder. Use the **Devices** option menu to display data for a signification device on the feeder; **Feeder Head** is the default selection.

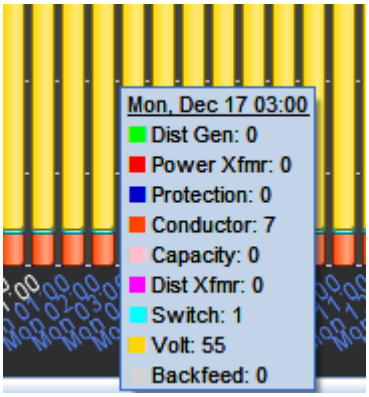
The Graphical View shows five different graphs:

- Current
- Feeder Violations
- Voltages
- Real Power
- Reactive Power

For the currents, voltages, and power graphs, the bar graphs show three bars, representing results data for three phases.

- The X axis displays the time of the forecast, with values for real-time loading, 24-hour forecast values, and 6 daily peak forecasts.
- The axis label colors are based on forecast type and are consistent with the colors used on the Date/Time column of the tabular display.
- Use the slider between the left side of the tab (displaying the Current and Violations) and the right side of the tab (displaying Voltage and Power) to resize the graphs.

When you hover over a point on a graph, a hover text box displays the actual data values, as shown below:



Feeder Load Overview Tab

The Feeder Load Overview tab provides feeder load data for the feeders that were selected when the Feeder Load Management window was initiated or updated (either from the Viewer or the Feeder Load Summary window).

In real-time mode, the Feeder Load Overview displays:

- Present measurements: Date/Time column values in green.
- Custom forecasts (for example, 72 hours of forecasting at 30 minute intervals): Date/Time column values in black.
- Daily peak forecasts for custom FLM forecasting intervals: Date/Time column values in blue.

In Study Mode, the Feeder Load Overview displays current study session data calculated by the Feeder Load Management tool based on the user's request from the Viewing and Modifying Study Session Parameters.

Toolbar

The Feeder Load Overview toolbar provides the following options:

- Click the **Feeder Details** button ( ) to open the Feeder Details window for the selected row.
- Click the **Focus** button ( ) to focus the Viewer on a selected feeder.
- Click the **Print** button ( ) to print the Feeder Load Overview table.
- Click the balloon callout button ( ) to display a balloon with data hidden in the main table view. The **Additional Columns** balloon may be turned off by clicking the button again. See **Selecting Columns to Display in the Table or Additional Columns Balloon** on page 17-20 for details.
- Click the **Auto Filter** button to show only rows that match the selected cell. Once an auto filter is applied, this button is replaced by the **Auto Filter Off** button.
- Click the **Auto Filter Off** button to remove a previously selected auto filter.

The toolbar also displays the current summary view name and the names of applied filters and sorts.

Feeder Load Overview Table

Feeder Load Overview Table Filter Pane
The Feeder Load Overview table has the following Global filters:

Filter Name	Description
All	Displays all data.
Daily Peaks	Displays only daily peak forecasts for the next 6 days.
Hourly Forecasts	Displays only forecasts for the next 24 hours.
Present Measurements	Displays only data for the present time.

Feeder Load Overview Table Columns
The Feeder Load Overview table includes the following columns:

- **Locked by Default:** the following columns will stay in view when scrolling horizontally and may not be hidden.
  - **Substation:** The substation name.
  - **Feeder:** The feeder name. This column displays a yellow background for rows with abnormal data source or/and data quality for any of the phases. See **Feeder/Device Condition Names and Colors** on page D-7 for more details.
  - **Feeder Condition:** The violation or warning (if any) on a feeder. When multiple violations/warnings occur on a feeder, this column shows the highest-level violation. See **Feeder Conditions** on page 17-8 for more information.
  - **Date/Time:** The date and time for the displayed feeder condition.
- **Unlocked by Default:** unlocked columns may be hidden and may move out of view as you scroll horizontally.
  - **Amps A:** Phase A feeder head load and utilization capacity.
  - **Amps B:** Phase B feeder head load and utilization capacity.
  - **Amps C:** Phase C feeder head load and utilization capacity.
  - **Amps N:** Feeder head neutral current.
  - **Limit Device (%):** device name and usage percentage for a phase limiting device with the biggest usage.
  - **Limit Device A (%):** Phase A limiting device name and usage percentage. Hidden by default.
  - **Limit Device B (%):** Phase B limiting device name and usage percentage. Hidden by default.
  - **Limit Device C (%):** Phase C limiting device name and usage percentage. Hidden by default.

- **kW A:** Feeder head Phase A active power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kW B:** Feeder head Phase B active power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kW C:** Feeder head Phase C active power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kW:** Total kW for all phases. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVAr A:** Feeder head Phase A reactive power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVAr B:** Feeder head Phase B reactive power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVAr C:** Feeder head Phase C reactive power. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVAr:** Total kVAr for all phases. Positive values indicate power flowing from substation to load. Negative values indicate power flowing from load (DERs) to substation. Hidden by default.
- **kVA A:** Feeder head Phase A apparent power. Hidden by default.
- **kVA B:** Feeder head Phase B apparent power. Hidden by default.
- **kVA C:** Feeder head Phase C apparent power. Hidden by default.
- **kVA:** Total kVA for all phases.
- **kV A:** Feeder head Phase A voltage.
- **kV B:** Feeder head Phase B voltage.
- **kV C:** Feeder head Phase C voltage.
- **Load (kW):** Feeder total true load.
- **Gen (kW):** The feeder's total generation.
- **Solar DER (kW A):** Phase A active power output from all solar DERs on a feeder. Hidden by default.
- **Solar DER (kW B):** B Phase active power output from all solar DERs on a feeder. Hidden by default.
- **Solar DER (kW C):** C Phase active power output from all solar DERs on a feeder. Hidden by default.
- **Solar DER (kW):** Total active power output from all solar DERs on a feeder.
- **Large DER (kW A):** Phase A active power output from all large DERs on a feeder. Hidden by default.

- **Large DER (kW B):** Phase B active power output from all large DERs on a feeder. Hidden by default.
- **Large DER (kW C):** Phase C active power output from all large DERs on a feeder. Hidden by default.
- **Large DER (kW):** Total active power from all large DERs on a feeder.
- **Dispatchable DER (kW A):** Phase A active power output from all dispatchable DERs on a feeder. Hidden by default.
- **Dispatchable DER (kW B):** Phase B active power output from all dispatchable DERs on a feeder. Hidden by default.
- **Dispatchable DER (kW C):** Phase C active power output from all dispatchable DERs on a feeder. Hidden by default.
- **Dispatchable DER (kW):** Total active power output from all dispatchable DERs on a feeder.
- **Loss:** Power loss for the feeder.
- **Score:** The EDA score of the feeder at the time of the condition.
- **:** The number of protection reach violations.
- **:** The number of conductor overload violations.
- **:** The number of switch overload violations.
- **:** The number of feeder capacity violations.
- **:** The number of service transformer overload violations.
- **:** the alarm count for distributed generation units.
- **:** The number of power transformer overload violations.
- **:** The number of voltage violations.
- **:** The number of backfeed violations.
- **PF Mode:** The type of solution used to solve the feeder (kVA or Power Flow).
- **Source A:** Phase A source. Hidden by default.
- **Source B:** Phase B source. Hidden by default.
- **Source C:** Phase C source. Hidden by default.
- **Quality A:** Phase A quality code. Hidden by default.
- **Quality B:** Phase B quality code. Hidden by default.
- **Quality C:** Phase C quality code. Hidden by default.
- **Wind Speed (mph):** The wind speed in miles per hour for the zone to which the feeder head belongs.
- **Cloud Cover:** The cloud cover for the zone to which the feeder head belongs.
- **Temp (F):** The Temperature in Fahrenheit for the zone to which the feeder head belongs.

- **Feeder DMS Settings** (see the Configuration Assistant chapter's **Using the Feeder Management Tab** on page 24-32 for details on feeder DMS settings).
  - **FLISR:** The feeder's current FLISR mode (Disabled, Manual, Automatic, Restore Only).
  - **FLM:** The feeder's FLM status.
  - **Optimization:** The feeder's current Optimization mode (Disabled, Manual, Automatic, Return to Nominal).
  - **FLA:** The feeder's FLA mode (Disabled, Sustained, Momentary and Sustained).
  - **Optimization Objective:** The feeder's current Optimization Objective (Conservation Voltage Reduction, Loss Minimization, Power Factor Correction, Relieve Violations, or None).
  - **Protection Schemes:** The feeder's protection scheme setting. Disabled, Manual, or Automatic mode.
  - **Protection Schemes Mode:** The feeder's protection scheme mode setting. Determines whether the protection scheme steps appear before or after the restoration switch step in Suggested Switching and FLISR switching plans.
- **Feeder Type:** The type of feeder (for example, Sub Transmission, Secondary, and so forth)
- **PF History:** The PF History status (Enabled, Disabled).

Sorting and Filtering
The Feeder Load Management tabular view supports Quick Sorting, Dynamic Filtering, and Auto Filtering.

Selecting Columns to Display in the Table or Additional Columns Balloon
You can choose which columns to display in the main table and which to display in the Additional Columns balloon. Selected columns will appear in the main table and other columns will appear in the Additional Columns balloon when the **Additional Columns** button ( ) is active. To select columns to display, follow these steps:

1. Right-click the table header row and select **Select Columns...** from the context menu. A list of the columns is displayed.
   - Selected columns are displayed in the table.
   - Deselected columns are displayed in the Additional Columns balloon.
2. To add a hidden column to the table view, select the check box next to the column name. It will no longer appear in the Additional Columns balloon.
3. To hide a column from the table view, deselect its check box. It will appear in the Additional Columns balloon.
4. Click **OK**.

   Note: If you want to save these columns settings so they will be used in future sessions, select **User Preferences** from the Web Workspace **Preferences** menu, and then click **Save**.

Viewing the Limiting Device by Phase
To view the limiting device in the viewer, right-click a Feeder Load Overview row and select from the **View Limit Device Phase** option for the applicable phase (for example, View Limit Device Phase A) from the context menu. Viewer 1 will focus on the device.

Starting a Study Session for Selected Row Profile
Each row in the Feeder Load Management window corresponds to a specific network condition. By selecting *Study Session for Selected Row Profile* from the right-click context menu, you can go directly into the **Power Flow Study Mode Load Scenario** to begin a study session in the Viewer based on the conditions in the row.

Forecast Accuracy Tab

The **Forecast Accuracy** tab shows the historical accuracy of previous forecasts and is useful for determining the likely accuracy of current forecasts. By default, the **Forecast Accuracy** tab shows a week of forecast data.

Toolbar Buttons

The Forecast Accuracy toolbar provides the following options:

- The **Begin Time** and **End Time** date/time selectors allow you to change the amount of data displayed.

  Note: The amount of historical data kept online is determined by the system administrator.

- Click the **Trend Graph** button ( ) to open the trend graph for the selected row.

- Click the **Focus** button ( ) to focus the Viewer on a selected feeder.

- Click the **Print** button ( ) to print the Forecast Accuracy table.

- Click the **Export** button ( ) to export the data in the Forecast Accuracy table.

- Click the **Auto Filter** button to show only rows that match the selected cell. Once an auto filter is applied, this button is replaced by the **Auto Filter Off** button.

- Click the **Auto Filter Off** button to remove a previously selected auto filter.

The toolbar also displays the names of applied filter.

Forecast Accuracy Table

The **Forecast Accuracy** table displays the following columns by default:

- The **Substation:** The substation name.
- **Feeder:** The feeder name.
- **Date/Time:** The date and time of the forecast.
- **Num Forecasts:** the number of forecasts.
- **kW Forecast:** The average forecast for 3-phase total kW.
- **kW Actual:** The actual kW value.

- **kW Forecast Error (%):** The error between the forecast kW to the actual kW.
- **kVAr Forecast:** The average forecast for 3-phase total kVAr.
- **kVAr Actual:** The actual kVAr value.
- **kVAr Forecast Error (%):** The error between the forecast kVAr and the actual kVAr.

The following columns are hidden by default (see **Understanding Column Display Options** on page 1-7 for details on hiding and unhiding columns):

- **Load Forecast:** The average forecast for True Load.
- **Load Actual:** The actual True Load value.
- **Load Forecast Error (%):** The error between the forecast True Load to the actual True Load.
- **Gen Forecast:** The average forecast for Generation.
- **Gen Actual:** The actual Generation value.
- **Gen Forecast Error (%):** The error between the forecast Generation to the actual Generation.
- **kW Max:** Maximum forecast for 3-phase total kW.
- **kW Min:** Minimum forecast for 3-phase total kW.
- **kVAr Max:** Maximum forecast for 3-phase total kVAr.
- **kVAr Min:** Minimum forecast for 3-phase total kVAr.
- **Load Max:** Maximum forecast for 3-phase total True Load.
- **Load Min:** Minimum forecast for 3-phase total True Load.
- **Gen Max:** Maximum forecast for 3-phase total Generation.
- **Gen Min:** Minimum forecast for 3-phase total Generation.
- **kW StdDev:** Standard deviation of forecasts for 3-phase total kW.
- **kVAr StdDev:** Standard deviation of forecasts for 3-phase total kVAr.

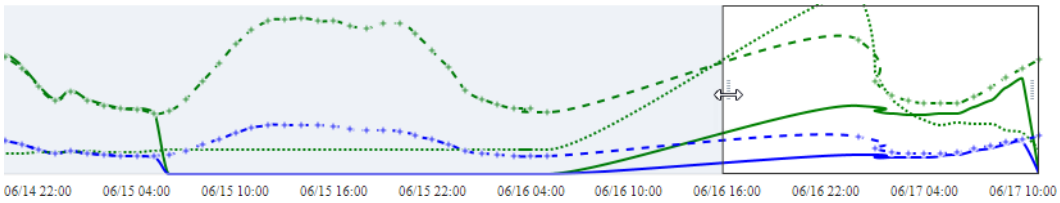
Forecast Accuracy Trend Graph

The Forecast Accuracy trend graph displays a graph of the data for the selected row. The trend graph displays the following data by default:

- Average forecast values for kW and kVAr.
- Actual values seen for kW and kVAr.
- Forecast error for kW and kVAr.

You can use the mouse wheel to zoom in and out. You can also drag the graph to see details over the time line.

You may also widen or shrink the viewport to show more or less detail. Hovering over the viewport left or right side will change the cursor to allow you to resize the box.



Hovering the mouse over the trend will show the value at the point in the graph.

Feeder Load Management Details

The **Feeder Load Management Details** window provides information about a selected row in the **Feeder Load Management** Feeder Load Overview Tab. It is accessed by double-clicking the row or by clicking the **Feeder Load Management Details** ( ) button.

The Feeder Load Management Details window has the following tabbed data views; any views that do not return data will be desensitized.

- Violations Tab**:** displays identified device overload violations and energy assessment warnings for the feeder selected in the Feeder Load Overview Tab.
- Tie Points Tab**:** displays all three-phase open tie points for the feeder selected in the Feeder Load Overview Tab.
- Transformers Tab**:** displays all Transformers electrically connected to feeder selected on the Feeder Load Overview Tab.
- Shunt Devices Tab**:** displays all downstream capacitor and reactor banks for the feeder selected on the Feeder Load Overview Tab.
- Equivalent Sources Tab**:** displays all sources electrically connected to the feeder selected on the Feeder Load Overview Tab.
- Load Details Tab**:** displays SCADA measurements and calculated flows for applicable devices.
- **Voltage Profile Graph:** displays voltage profile loads for the selected feeder on the Feeder Load Overview Tab.

Violations Tab

The **Violations** tab displays identified device overload violations and energy assessment warnings for the feeder selected in the Feeder Load Overview Tab pane.

The Violations data includes the following columns:

- **Device:** The device's name.
- **Violation:** The violation or warning name. See **Feeder/Device Condition Names and Colors** on page D-7 for range of values and colors for this column.
- **Phase:** The phase that the violation is on
- **Value:** The violation/warning value

- **%:** Value percent of limit or nominal voltage, for voltage violations and warnings. The Violations table is sorted based on this column.
- **Limit:** The device limit for violated attribute.
- **Units:** The validation type unit (that is, A, kVA, kVAr, kV).

Violations Toolbar
The Violations toolbar provides the following options:

- Click the **Focus** button ( ) to focus t to focus the Viewer on the selected device.
- Click the **Print** button ( ) to print the table.
- Select the data criteria from the **Violations and Warnings** context menu; options are: Violations Only, Warnings Only, or Violations and Warnings context menu.
- Select the device class from the **Violations Types** context menu. The number of devices having the violations or warnings is provided in parenthesis.

Device Violations History Window
The Device Violations History window provides information about the violations history on a selected device. To access the window, select a row for a device in the **Violations** tab, right-click and select **Device Violations History...**.

It includes following columns.

- **Violation Type:** The Type of the violation (for example, Under Voltage, Over Voltage).
- **Value:** The violation value.
- **Limit:** The device limit for violated attribute.
- **%:** The percentage of the limit; for example, if a device was 5 percent over the limit, the value in the column would be 105.
- **Phase:** The phase that the violation is on.
- **Units:** The validation type unit (A, kVA, kVAr, kV).
- **Start Date:** The date and time when the violation began.
- **End Date:** The date and time when the violation ended.

The Device Violations History window also shows the selected device's class and name above the table.

Relieve Violations Option
The **Violations** tab provides an option that allows you to select a violation and automatically invoke the **Suggested Switching Relieve Violations** objective. This option will focus the Viewer on the selected device, create a Viewer study session (if not already created), set up the load scenario in the Viewer to match the date and time of the violation, and, finally, open Suggested Switching with the Relieve Violations objective already selected.

Note: If a study session has already been created in the Viewer, a confirmation dialog box will let you know that starting the Study Session will reset the topology to real-time.

Click **Next** on the Suggested Switching window to start generating a plan (since the loading conditions and objective have already been preselected). This option allows you to quickly generate a set of suggested switching steps to mitigate a future forecast violation.

Tie Points Tab

The Tie Points tab displays all three-phase open tie points for the feeder selected in the Feeder Load Overview Tab. A tie point is a three-phase open switch of an accepted and configured set of switch classes. The open switch doesn't need to be in its nominal position.

The Tie Points Capacity table includes the following columns:

- **Tie Point:** The tie point name
- **To Feeder:** The adjacent feeder that will be connected to the current feeder if the tie point is closed.
- **To Substation:** The *To Feeder's* substation name
- **To Feeder Amps A:** To Feeder Phase A Current
- **To Feeder Amps B:** To Feeder Phase B Current
- **To Feeder Amps C:** To Feeder Phase C Current
- **Pickup Amps A:** Phase A current pickup capacity
- **Pickup Amps B:** Phase B current pickup capacity
- **Pickup Amps C:** Phase C current pickup capacity
- **Limit Device Phase A:** ID of limiting device for Phase A.
- **Limit Device Phase B:** ID of limiting device for Phase B.
- **Limit Device Phase C:** ID of limiting device for Phase C.

Tie Points Toolbar

The Feeder Tie Points Capacity Overview toolbar provides the following options:

- Click the **Focus** button ( ) to focus the Viewer on a selected feeder. This button is disabled until the user selects a row in the Tie Points Capacity table.
- Click the **Feeder Load Management** button ( ) to open Feeder Load Management 2 for the feeder listed in the To Feeder column of the selected row. This button is disabled until the user selects a row in the Tie Points Capacity Overview table. If Feeder Load Management 2 is already open, it is updated with the data for the "To Feeder."
- Click the **Print** button ( ) to print the Tie Points table.

Transformers Tab

The Transformers tab displays all Transformers electrically connected to feeder selected on the Feeder Load Overview Tab.

The Transformer Details table includes the following columns:

Note: Administration and Full Operations users can change some of regulation devices parameters in Real-Time Mode for SCADA and non-SCADA devices. If configured this will send out the associated control action for SCADA devices. All user types have access to edit regulation device parameters while in study mode; no control actions will be sent out, the status will simply be reflected in the NMS model for study simulations.

- **Device:** The device name
- **Device Type:** The type of device (Regulator or Transformer)
- **kV A:** Device Phase A Voltage
- **kV B:** Device Phase B Voltage
- **kV C:** Device Phase C Voltage
- **Voltage Setpoint:** The voltage regulation set point. Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box when the Regulation Type is not **No Tap** or **Fixed Tap** and the Automatic Control is **On**.

  Note: If the device is configured for unganged regulation each independent phase specific voltage setpoint will be displayed in this column. For devices that are configured for ganged regulation a single voltage setpoint will be displayed.
- **Tap Step:** The tap position. Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box to a value between **Min Tap Step** and **Max Tap Step** when the Regulation Type is not **No Tap** and Automatic Control is **Off**.

  Notes:

  - If the feeder was solved using a kVA based power flow solution, this column will display **N/A** since tap position cannot be solved for.
  - If the device is configured for un-ganged regulation each independent phase specific tap position will be displayed in this column. For devices that are configured for ganged regulation a single tap position will be displayed.
- **Min Tap Step:** The minimum tap step position
- **Max Tap Step:** The maximum tap step position
- **Regulation Type:** The regulation type
- **Automatic Control:** Specifies if the device is automatically regulated to the Voltage Setpoint. Administration and Full Operations users can change this value using the Regulation Device Parameters dialog box to **On** or **Off** when the Regulation Type is not **No Tap** or **Fixed Tap**.
- **Limit:** The limit of the device.

  Note: For transformers, this value will be displayed in kVA; for regulators, the value will be displayed in Amps.

Shunt Devices Tab

This tab displays all downstream capacitor and reactor banks for the feeder selected on the Feeder Load Overview Tab.

The Shunt Devices table includes the following columns:

> **Note**: Administration and Full Operations users can change some of the applicable regulation device parameters in Real-Time Mode for SCADA and non-SCADA devices. If configured this will send out the associated control action for SCADA devices. In study mode all user types have access to edit regulation device parameters. While in study mode NO control actions will be sent out, the status will simply be reflected in the NMS model for study simulations.

- **Device:** The device name
- **Device Type:** The type of device (Capacitor or Reactor)
- **kVAr A:** Device Phase A Reactive Power
- **kVAr B:** Device Phase B Reactive Power
- **kVAr C:** Device Phase C Reactive Power
- **On Threshold:** The on threshold. Administration and Full Operations users can change the value of this column when the Regulation Type is not fixed and the Automatic Control is on.
- **Off Threshold:** The off threshold. Administration and Full Operations users can change the value of this column when the Regulation Type is not fixed and the Automatic Control is on.
- **Position:** Indicates the current shunt status being either "`on`" or "`off`". When the device is in the `off` state, it will also show open in the NMS model. It will be expected that operators will use the **Open**/**Close** Control Tool operations to alter the state of the shunt.

  Note: If the feeder was solved using a kVA based power flow solution and the capacitor is voltage regulating, this column will display **N/A** since energized steps cannot be solved for.
- **Regulation Type:** The regulation type of the shunt devices. The regulation types is displayed as one of the following: Fixed, Bus Voltage, Line Current, Line VAR, Line Power Factor, or Temperature.
- **Measurement Attribute:** The monitored attribute of regulated bus voltage, line flow, or area time/temperature.
- **Automatic Control:** Administration and Full Operations users can switch the value of this column between on and off when the Regulation Type is not fixed.
- **Quality:** Indicates the data validity. Possible values: Valid, Suspect, Invalid, or Estimated. Estimated is used to indicate if NMS has performed state estimation on the capacitor based on provided SCADA telemetry.
- **Operations Count:** Number of close operations on the shunt device in the last calendar day or configured history period.
- **Operations Count Threshold:** Threshold limit of close operations beyond which Optimization penalizes the shunt device.

Equivalent Sources Tab

This tab displays all sources electrically connected to the feeder selected on the Feeder Load Overview Tab.

The Equivalent Sources table includes the following columns:

> **Note**: The option to adjust regulation settings for **Equivalent Sources** will only be present while in study mode. These devices represent pseudo points in the model and it would not be realistic to adjust these in a real-time setting. In study mode all user will have the ability to alter the settings to try "what-if" scenarios and see how changes would affect the model.

- **Source Name:** The name of the source
- **kW A:** Source Phase A Active Power
- **kW B:** Source Phase B Active Power
- **kW C:** Source Phase C Active Power
- **kVAr A:** Source Phase A Reactive Power
- **kVAr B:** Source Phase B Reactive Power
- **kVAr C:** Source Phase C Reactive Power
- **Amps A:** Source Phase A Current
- **Amps B:** Source Phase B Current
- **Amps C:** Source Phase C Current
- **kV:** Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box for non-SCADA devices. Measurements for SCADA devices may be edited in the SCADA Summary by right-clicking a SCADA device row and choosing the **SCADA Summary** option from the context menu.
- **Angle:** Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box for non-SCADA devices. Measurements for SCADA devices may be edited in the SCADA Summary by right-clicking a SCADA device row and choosing the **SCADA Summary** option from the context menu.
- **Validity:** Data validity. Possible values: Valid, Suspect, or Invalid.

Distributed Generation Tab

This tab displays all downstream Distributed Generation for the feeder selected on the **Feeder Load Overview Tab**.

The Primary|All option menu on the toolbar allows you to select from:

- **Primary** (default)**:** restricts the display to significant (Utility Owned or Commercial) units.
- **All:** include net-metered residential units.

The Distributed Generation table includes the following columns:

> **Note:** Administration and Full Operations users can change some of the applicable regulation device parameters in Real Time Mode for SCADA and non-SCADA devices. If configured, this will send out the

associated control action for SCADA devices. In study mode, all user types have access to edit regulation device parameters. While in study mode, no control actions will be sent out; the status will simply be reflected in the NMS model for study simulations.

- **Name:** The name of the generator
- **kV A**: Voltage A (kV)
- **kV B**: Voltage B (kV)
- **kV C**: Voltage C (kV)
- **kW:** Real Power Output (kW). Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box to a value between 0 and the generator output.
- **kVAr:** Reactive Power Output (kVAr). Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box to a value between 0 and the generator output.
- **Voltage Regulation:** Indicates if Voltage Regulation is present. Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box to either on or off for devices that are voltage regulated.
- **Voltage Setpoint:** The voltage regulation set point. Administration and Full Operations users can change this value using the **Regulation Device Parameters** dialog box when Voltage Regulation is present on the device and turned on.
- **Min PF - Leading:** Minimum Leading Power Factor
- **Min PF - Lagging:** Minimum Lagging Power Factor
- **Target kW:** Real Power Target (kW)
- **Target kVAr:** Real Power Target (kVAr)
- **TTL Expiration:** the time to live expiration of the generator. Administration and Full Operations users can reset this value using the **Regulation Device Parameters** dialog box if the device is affected by TTL. This value can be driven from a SCADA signal.
- **Status:** whether the unit is **On** or **Off**; can be driven from a SCADA signal. Like, kW and kVAr, the status can be modified using the Regulation Device Parameters dialog box.
- **Charge Mode:** whether the unit is Charging, Discharging, or Idling; can be driven from a SCADA signal.
- **Wind Speed (mph):** the wind speed of the DER zone.

  Note: For wind DERs, it will show the speed of its zone; for non-wind DERs, it will show N/A.
- **Cloud Cover:** The cloud cover of the DER zone.

  Note: For solar DERs, it will show the cloud cover data of its zone; for non-solar DERs, it will show N/A.

Load Details Tab

The Load Details tab displays all sources electrically connected to the feeder selected on the Feeder Load Overview Tab. The feeder head will typically characterize each feeder

and 3 to 5 closed sectionalizing devices. Some of these sectionalizing devices will have measurements and may be supervisory control points.

> **Note:** This pane is available only when a present load row is selected in the Feeder Load Overview table.

Click the power flow results button ( ) to toggle on/off a filter that displays only SCADA readings. When toggled on, only SCADA devices are displayed in the Load Details table. This view displays the device readings and data quality.

The Load Details includes the Feeder Load Details table and a toolbar. In study mode, the toolbar includes a refresh button and a device field that allows you to add a particular device to the Load Details screen and the Devices drop-down list on the FLM Graphical View tab. Click the Refresh button to trigger a new solution with this device. The Load Details table includes the following columns:

- **Device:** The name of the device.
- **Amps A:** Solved Phase A Current
- **Amps B**: Solved Phase B Current
- **Amps C**: Solved Phase C Current
- **Amps N**: Solved Neutral Current
- **kW A:** Solved Phase A Active Power
- **kW B**: Solved Phase B Active Power
- **kW C**: Solved Phase C Active Power
- **kVAr A:** Solved Phase A Reactive Power
- **kVAr B:** Solved Phase B Reactive Power
- **kVAr C:** Solved Phase C Reactive Power
- **kVA A:** Solved Phase A Apparent Power
- **kVA B:** Solved Phase B Apparent Power
- **kVA C:** Solved Phase C Apparent Power
- **kV A:** Solved Phase A Voltage
- **kV B:** Solved Phase B Voltage
- **kV C:** Solved Phase C Voltage
- **Has SCADA:** Flag indicating whether it is a SCADA device (hidden by default).
- **Quality A:** Phase A quality code. Displayed when the power flow results button has been toggled on.
- **Quality B:** Phase B quality code. Displayed when the power flow results button has been toggled on.
- **Quality C:** Phase C quality code. Displayed when the power flow results button has been toggled on.

Quality codes can be one of the following:

- **Filtered:** Measurement point has been filtered (removed) from consideration in the load flow engine.
- **Valid:** All data associated with this measurement seems to be valid.

- **Invalid:** Measurement point has been flagged as invalid by data gathering system (for example, SCADA).
- **Estimated:** Value has been estimated by state estimation.
- **Suspect:** A component of a field measurement that contributes to this value is missing, out of range, or otherwise suspect.
- **Load:** There is an irreconcilable mismatch between the load reported by field measurements and the load flow model. For example, a section with no generation has negative load.
- **Profile:** There is a significant difference between the expected power factors from the model and that reported by field measurements.

- **Factor A (kW/kVAr):** The phase A kW/kVAr scaling factors that are applied to scale the load. Displayed when the power flow results button has been toggled off and SCADA values are displayed.
- **Factor B (kW/kVAr):** The phase B kW/kVAr scaling factors that are applied to scale the load. Displayed when the power flow results button has been toggled off and SCADA values are displayed.
- **Factor C (kW/kVAr):** The phase C kW/kVAr scaling factors that are applied to scale the load. Displayed when the power flow results button has been toggled off and SCADA values are displayed.

Voltage Profile Graph Tab

The Voltage Profile Graph tab displays a graph of voltage load (p.u.) versus distance from the feeder head for a feeder selected in the Feeder Load Overview Tab. The graph also displays the upper and lower ANSI Range A violation limits (1.05 and 0.95 p.u., respectively).

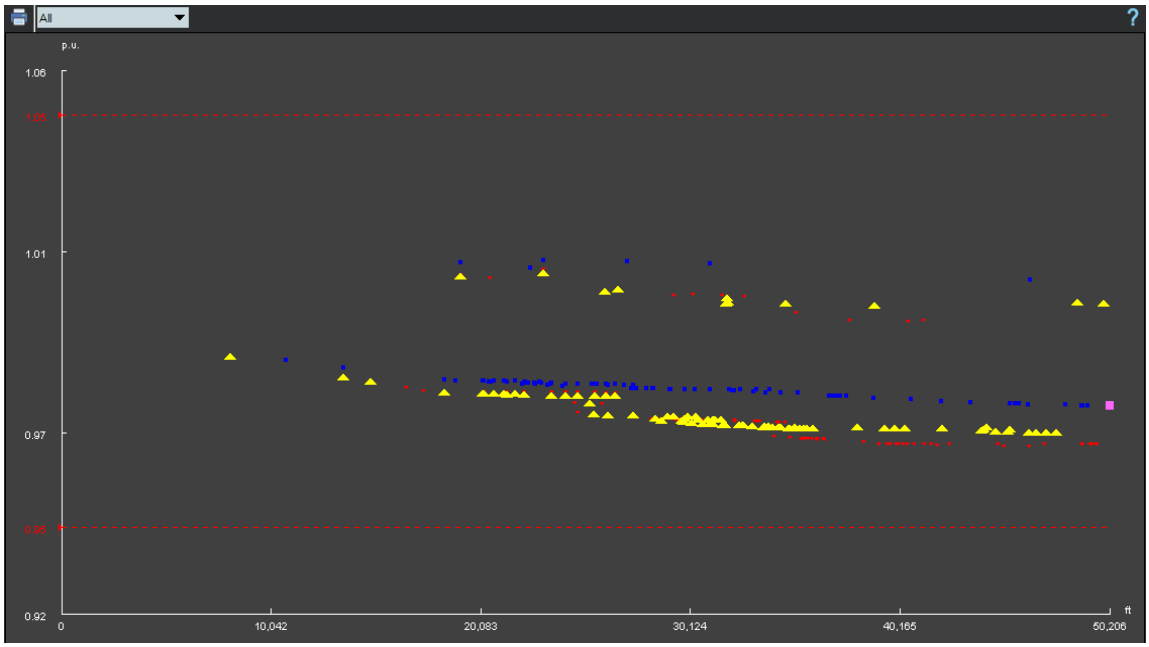
> **Note:** This pane is available only when a present load row is selected in the Feeder Load Overview table.

Supply points are represented by a symbol in their phase color. You can choose to view all phases (default) or individual phases by selecting the phase from the drop-down list.

Drop-Down List Options

- **All:** displays all phases plotted in their respective colors.
- **Phase A:** Phase A loads are displayed (red dots).
- **Phase B:** Phase B loads are displayed (yellow triangles).
- **Phase C:** Phase C loads are displayed (blue squares).

Note: Bellwether loads are displayed in pink.



Using Real-Time and Study Mode

If you start or update the Feeder Load Management Tool from the Viewer, the tool's mode is defined by the Viewer's mode.

If you start or update the tool from the Feeder Load Summary window, the tool opens in real-time mode. Once the tool is open, you can switch modes by clicking the corresponding button on the toolbar or selecting the appropriate menu option.

When you start the tool in Study Mode or switch from real-time to study mode inside the tool, the **Power Flow Study Mode Load Scenario** dialog box prompts you to select the Load Profile from either the real-time system or from a specific period (hour and type of day).

Viewing and Modifying Study Session Parameters

The Study Session Parameters dialog box allows you to request a new Feeder Load Management calculation for the current study session's topology. You can specify the type of forecast to calculate (for example, next 24 hours, daily peaks, specific day, or a specific period) and alter various options to take into consideration.

An existing study session is used as the Feeder Load Management Tool Study Session or, if none exists, a new study session is created based on the real-time data. You can reset the study session to nominal or real-time data from the Viewer. To view the power flow option settings in the Viewer, select **Show PF Options** in the Viewer's **Option** menu.

> **Note:** The Feeder Load Management mode **does not chang**e when the Viewer switches between real-time and study mode.

To display the Study Session Parameters dialog box, do one of the following:

- In real-time mode, select **Study Mode** from the **Actions** menu.
- In study mode, select **FLM and Power Flow Options** from the **Options** menu.

The Study Session Parameter dialog box displays the following fields and buttons.

Feeder Load Management Options Pane

- **Hourly Forecasts:** run hourly studies to include load scaling determined by real-time SCADA values
- **Specific Day Forecasts:** run hourly studies on the selected day.
- **Daily Peak Forecasts:** run daily peak studies.
- **Specific Period** - Run a single study for the specified period:
  - **Scale:** enter the Scaling Factor, which is a number that modifies the loading conditions for the selected profile. Typically a value of 1.0 is used; if you want to study the impact of increased or decreased load, enter values greater than or less than 1.0, respectively.
  - **Day:** select the type of day. In the product configuration, the **Day** options are Weekday, Weekend, and Seasonal Peak with capacitors on or off.
  - **Temp (F):** chose the temperature range to use for adjusting load conditions or temperature based limits. For each real-time based day type (weekday, weekend), multiple sub profiles exist representing different temperatures

bands to characterize how the load behaves on that type of day for a range of temperature (for example, 80°F - 90°F). Using temperature as a parameter allows better simulation results to be achieved. For example, a weekday at 60°F versus a weekday at 100°F will have far different loading conditions. For temperature based limits, this parameter will drive the limits used for power transformers and conductors. Each of these device types will have predefined limits for a temperature band and this value will drive the limit used in the analysis.

Note: The temperature parameter will be grayed out if both **Temperature Based Profiles** and **Temperature Based Limits** have been turned off. These can be set using SRS rules **USE_TEMP_PROFILES** and **USE_TEMP_LIMITS**, respectively. If temperature based profiles are turned off, it will be expected that a customer will provide a single profile for each load that will be used for all ranges of temperatures.

- **Wind Speed (mph):** select the wind speed available for wind power sources.
- **Cloud Cover:** select the amount of cloud cover (for example, Clear, Mostly Clear, Partly Cloudy, Mostly Cloudy, Cloudy)
- **Residential Battery:** select the profile for battery charge/discharge cycles (for example, On, Off).
- **Residential Fuel:** select the profile for fossil fuel use (for example, On, Off).
- **Utility Battery:** select the profile for utility scale battery charge/discharge cycles (for example, On, Off).
- **Utility Fuel:** select the profile for fossil fuel based units (for example, 25%, 50%, 75%, 100%).
- **DR:** select the profile for demand response objects (for example, On, Off).

Limits Pane

- **Limit Type:** The Limit Type is either **Normal**, **Emergency (Long Term)**, or **Emergency (Short Term)**.
- **Season:** Indicates the season (for example, Spring).

  Note: The season drop-down list will only be displayed if seasonal limits have been configured. If a project is using temperature based device limits, this option will not be available.
- **Voltage Limits:** Specifies high and low voltage limits.

Interval Pane

The Interval pane allows you to configure the forecast interval for the study. These options are only applicable to the **Hourly Forecasts**, **Specific Day Forecasts**, and **Specific Period** forecasts. Note that the maximum number of forecasts requested in a study is defined by the event management rule FLM Forecasts Study Period Defaults.

- **Number of Hours:** Set the number of hours over which the study will be run.
- **Forecasts per Hour:** Set the number of forecasts per hour. Note that if the FLM load period is set to 24 or less this option will be disabled and default to 1 forecast per hour.

Buttons

- **Reset:** Click **Reset** to reset to previous values.
- **OK:** Click **OK** to request the calculation for the selected feeders. See **Requesting a New Feeder Load Management Calculation** on page 17-35.
- **Cancel:** Click **Cancel** to exit the Study Session Parameters dialog box.

Requesting a New Feeder Load Management Calculation

To request a new Feeder Load Management Study Mode calculation, follow these steps:

1. Do one of the following to open the Study Session Parameters dialog box:
   - In real-time mode, select **Study Mode** from the **Actions** menu.
   - In study mode, select **FLM and Power Flow Options...** from the **Options** menu.
2. Complete the fields on the Study Session Parameters dialog box.
3. Click **OK**. The rows will clear. When the forecasts are ready, the **Refresh** ( ) button will enable.
4. Click **Refresh** ( ) to update the table data.

   The results of the calculation are displayed on the Feeder Load Management Overview pane.
5. View other Feeder Load Management Window panes for more information.

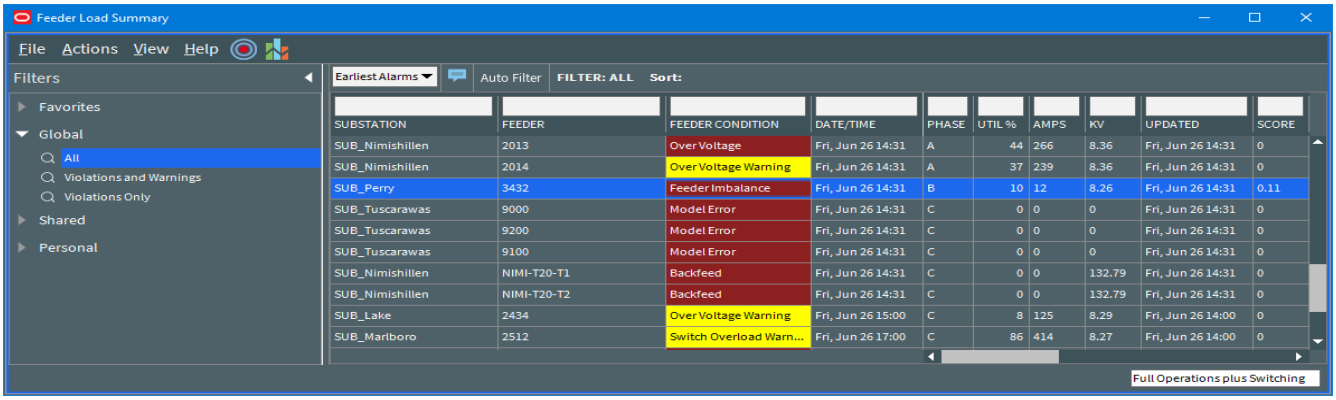
Data Source and Data Quality

Possible sources of data for a feeder head are Default, SCADA, or Manual Entry. SCADA is considered to be the normal source; the other two are considered abnormal.

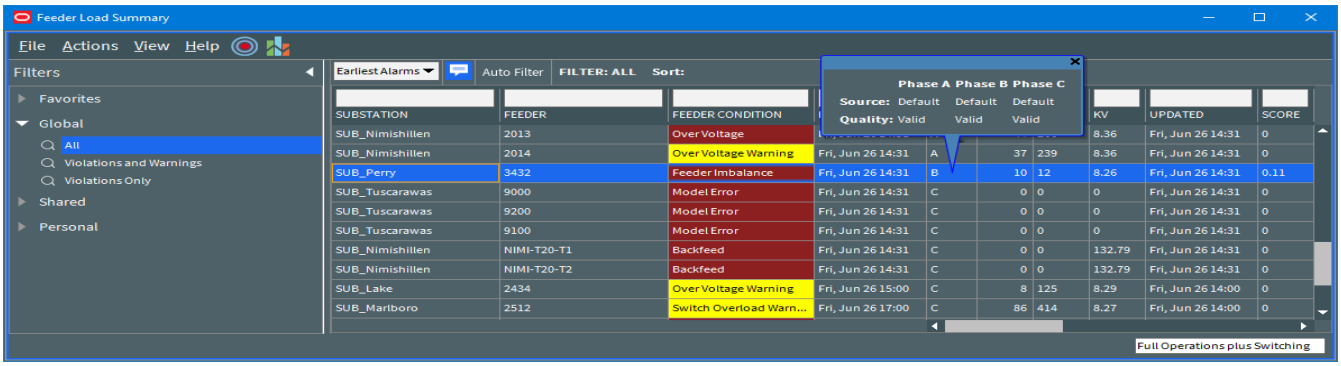
Possible values of data quality are:

- **Valid:** data is valid.
- **Suspect:** there are inconsistencies in the data that the system cannot reconcile, which indicates a possible misconfiguration of SCADA or model data.
- **Invalid:** the SCADA system has reported a measurement as being unusable.
- **Load:** indicates a measurement is suspect because the system is unable to scale the loads to match it.
- **Profile:** indicates a potential mismatch between modeled load profile Power Factor and the value determined from SCADA. Incorrectly modeled shunt devices can also trigger this value.
- **Filtered:** Value from SCADA was not used to scale Power Flow solution.

A yellow or red background for a Feeder Condition in Feeder Load Summary or Feeder Load Overview indicates that the feeder head data source and/or quality is abnormal.



Data source, quality, and alarm counts are not included in Feeder Load Management tables by default. To see this additional information, enable balloon details and select a table row.



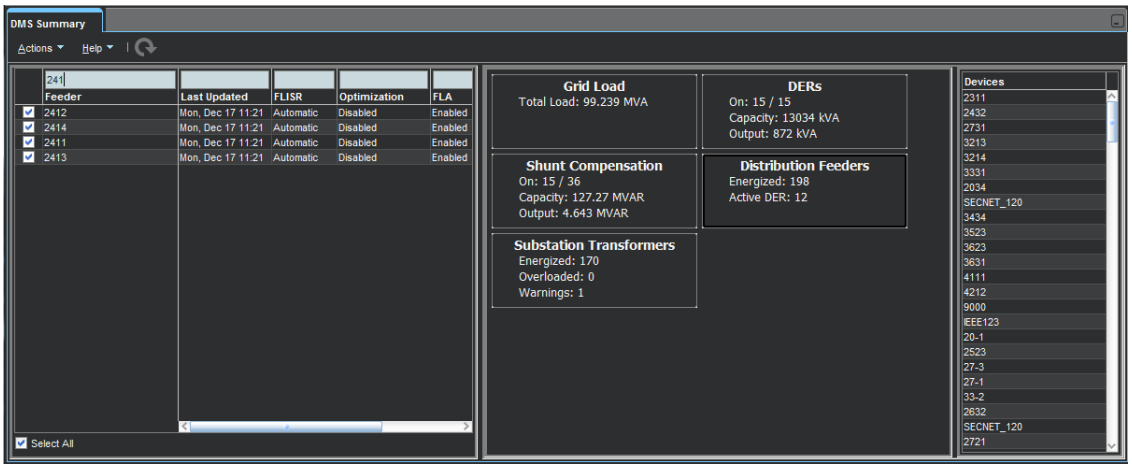
Identifying Devices with SCADA Suspect and SCADA Inconclusive Results

After finding that a power flow will not solve due to a suspect SCADA data, you can use FLM to identify the devices that are returning bad data. You may identify the problem by viewing a device in the **Viewer** and seeing that the Power Flow will not solve or by seeing a Suspect SCADA feeder condition in the **Feeder Load Summary**.

1. Once you have opened FLM, notice the row with the Suspect SCADA condition.
2. Select the row and click the **Feeder Details** button ( ).
3. Select a row with Suspect data and click the Viewer **Focus** button ( ).

Using the DMS Summary

The DMS Summary displays the summary of the distribution system for FLM-enabled feeders.



The DMS Summary is comprised of three panes:

1. The Feeder pane (left) displays a table with the FLM-enabled feeders in the subscribed zone. The filter box allows you to filter the list to quickly find a feeder of interest. The check box allows you to select or deselect all feeders. The table provides the following columns:
    - Feeder
    - Last Updated
    - PF Mode (hidden by default)
    - FLISR
    - FLM (hidden by default)
    - Optimization
    - FLA
    - Optimization Objective
    - Protection Scheme
    - Protection Scheme Mode

- Feeder Type (hidden by default)
- PF History (hidden by default)

Note: See **Understanding Column Display Options** on page 1-7 for information on unhiding and hiding table columns.

2. The middle pane displays the status of **Grid Load**, **DERs**, **Distribution Feeders**, **Shunt Compensation**, and **Substation Transformers**.
3. The Devices pane (right) displays a list of devices providing data for the block selected in the middle pane.

When there is an update available from FLM, the **Refresh** button ( ) will be enabled; click the **Refresh** button to update the DMS Summary data.

If you select a device listed in either the left pane or right pane and right-click, you can select **View...** to focus the device in the Viewer.

Using the FLM Island Statistics Window

Statistics pertaining to the performance of real-time power flow and FLM solutions are available through the FLM Islands Statistics window, which is accessed by selecting **FLM Islands Stats...** from the Web Workspace **Tools** menu. By default, this option is only available for **Administration** or **Trainer** user types.

The tool is a visualization of the FLM_ISLANDS database table. The table is updated every time the periodic FLM solution runs; with the default product configuration, this is every 900 seconds (15 minutes). Various information about the performance of the solution is written to that table.

An *island* is defined to be all network fed from the same (set of) energization sources. For most customers, this is typically a substation and its distribution feeders. If the model is split, islands start at the location of the split.

The tool is useful in getting a high-level summary on the performance of the power flow engine for real-time solves and allows application support staff to identify areas of the model that are having difficulty solving.

The columns shown by default on the page are:

Column Name	Description
Island Name	The name of the island as determined by one of the energization sources and the corresponding entry in the data model FEEDERS table.
Status	The status of the power flow solution. These match the values reported in FLM. Typically, this can be one of: Solved, Suspect SCADA, Model error, Failed.
Updated	The time the last information was written for this island.
Solve Time	The time take to perform the state estimation, power flow solution, and SCADA load allocation.
Supply Connections	Report how many energization source nodes feeder the island.

Column Name	Description
Feeders	How many FID or MID nodes are present in the model. This is broadly related to the number of distribution feeders plus power transformers. The exact location of each of these nodes is determined during model design and project implementation.
Buses	Number of connection points in the island. Each device (Transformer, switch, conductor, and so on) has a connection point at each end.
Powerflow Iterations	Number of iterations of the power flow engine to converge on a solution.
State Estimator Iterations	Number of iterations of the state estimator (capacitor status, network protector status, and/or regulating DERs) to converge on a solution.
SCADA Iterations	Number of iterations of the SCADA load allocation engine to converge on a solution.
Total Iterations	Sum of the previous three columns.
Voltage Violations	Number of voltage violations (Low or High) detected by the power flow.
Flow Violations	Number of thermal violations detected by the power flow.
Transformers	Number of transformers in the islands. This figure typically excludes service transformers as they tend to be modeled as load points for the power flow. If, however, the load and DER behind the xfmr is dis-aggregated then the service transformers do get included in this count. This is implementation dependent and typically depends on the level of behind the meter DER penetration there is in a service territory.
Shunts	Number of shunted devices (capacitors, SVCs, or reactors) in the island.
Switches	Number of switchable devices (typically breakers, reclosers, load-break switches, non-load break switches, and fuses).
Distributed Generators	Number of DER units (primary and behind the meter) that are in the island.

Columns available but hidden by default include:

Column Name	Description
kW Gen Phase A|B|C	Per phase real power generation in the island.
kVAr Gen Phase A|B|C	Per phase reactive power generation in the island (excludes Caps, SVC, and Reactors).
kW Load Phase A|B|C	Per phase real power load in the island.
kVAr Load Phase A|B|C	Per phase reactive power load in the island.

Column Name	Description
kW Cap Phase A|B|C	Per phase real power support in the island (from Caps, SVC, and Reactors). Almost always zero.
kVAr Cap Phase A|B|C	Per phase reactive power support in the island (from Caps, SVC, and Reactors).
kW Loss Phase A|B|C	Per phase technical real power loss in the island (typically from conductors).
kVAr Loss Phase A|B|C	Per phase technical reactive power loss in the island (typically from conductors).
kW Xfmr Loss Phase A|B|C	Per phase technical real power loss in the island from transformers (excludes service transformers modeled as loads).
kVAr Xfmr Loss Phase A|B|C	Per phase technical reactive power loss in the island from transformers (excludes service transformers modeled as loads).
SRC Class	The class handle of one of the energization sources feeding the island.
SRC Index	The index handle of one of the energization sources feeding the island.

The statistics table supports all standard table functionality for the NMS user interface, including filtering, automatic filtering, column selection, column locking, copying, and printing.

You can select a row and navigate to the island in the Viewer by clicking the **Viewer Focus** button ( ) in the toolbar.

The rows have the following context menu options:

- **Auto Filter:** Activates auto filtering based on the selected cell.
- **Show Errors and Statistics...:** Opens the FLM Feeder Errors, Warnings, and Details window, which displays detailed information about model data errors and warnings. The FLM Feeder Errors, Warnings, and Details window also provides a deep dive into the solution details and information about the areas of the model where convergence is taking a long time.

Chapter 18

Fault Location, Isolation, and Service Restoration

This chapter describes the Oracle Utilities Network Management System (NMS) Fault Location, Isolation, and Service Restoration (FLISR) functionality.

> **Note**: The features described in this chapter are specific to the FLISR functionality. For information about the Fault Location Analysis (FLA) feature, see **Fault Location Analysis** on page 19-1.

This chapter includes the following topics:

- Overview
- Setting the System FLISR Mode
- Understanding FLISR Events in the Work Agenda
- Using the FLISR Report Tab in Event Details
- Viewing FLISR Disabled Devices
- Viewing FLISR Conditions
- Using the FLISR Flow Summary Window
- Optimizing the Network with FLISR Preferred Plan

Overview

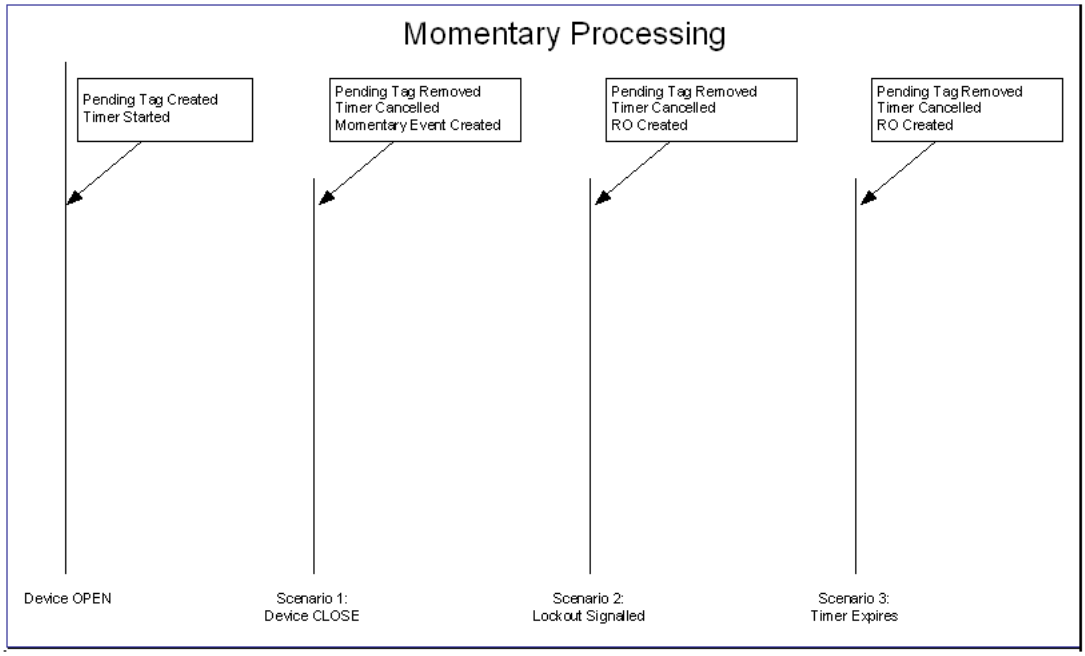
FLISR responds to protection trips of SCADA monitored and controlled switches (that is, feeder circuit breakers (CB) and downstream reclosers (ACR)). FLISR automatically identifies the faulted section using the telemetered Protection Trip and Fault Indication flags and then (in Auto Mode) automatically schedules the isolation and restoration actions to restore the non-faulted areas de-energized by isolating the fault. In Manual Mode, FLISR will present the isolation and restoration actions for execution by the user. If Oracle Utilities Network Management System **Power Flow** is implemented, FLISR will use power flow analysis in the solution analysis.

The following figures show the sequence of events in a FLISR scenario.

The first figure shows the various scenarios in the momentary processing. The scenarios are:

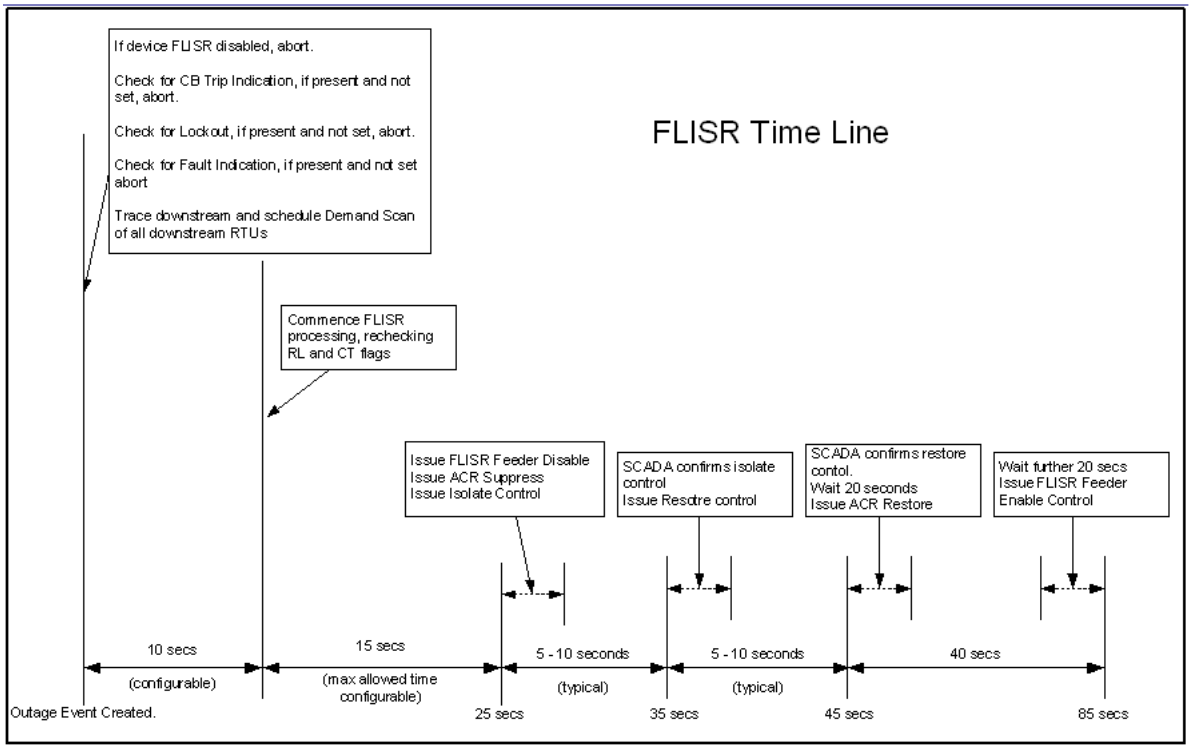
1. A breaker trips and is followed a short time later by a reclose operation.
2. A breaker trips and is followed by a recloser lockout.

3. A breaker trips but the device has no recloser lockout signal available. FLISR waits a configurable amount of time and, in the absence of a close operation, assumes lockout to have occurred.



Note: RO (Real Outage) is created only if customer supply nodes are de-energized as a result of the operation.

Once an RO is created, the FLISR processing sequence shown in the following figure is initiated.



The control sequence (starting at around 25 seconds) is only performed in automatic mode. In manual mode an operator must initiate the control sequence.

Timings in the above diagram are only indicative. Actual values will depend on the complexity of the solution required and the responsiveness of the isolate/restore controls sent to SCADA. The following timings are deterministic:

- The delay allowed for demand scans. This is configurable and defaults to 10 seconds.
- The maximum solution time allowed in automatic mode. This is configurable and defaults to 15 seconds. If the solution takes longer to solve than this time, FLISR will not automatically execute the control sequence. The option for an operator to manually initiate the control sequence is preserved.
- Maximum time allowed for automatic operations after the lockout is: Demand scan delay + maximum solution time. The default configuration is 25 seconds.
- Wait times for Recloser operations. These are 20 seconds.
- Any error conditions detected during process are logged in the Event Log.

Understanding FLISR Voltage Loss Detection Triggers

FLISR responds to devices reporting loss of voltage. In the event of a device reporting loss of voltage, FLISR traces upstream of the reporting device to figure out the top level device that is experiencing the loss of voltage. Sub-station breakers should be inherited from flisr_sectionalizer inheritance and should be configured as protective devices for FLISR to process them.

After determining the top level device, FLISR creates a *PDO* and assumes that the fault is between this device and the first SCADA sectionalizer below it. FLISR opens the SCADA device and restores the downstream section using the tie switches.

When FLISR detects a device reporting loss of voltage, it waits for momentary processing and then checks whether the device is reporting currents and voltages below the threshold. FLISR is able to process this scenario for single-phase or multi-phase fault events. If FLISR determines that the fault is in the substation, it waits for a configurable amount of time (default 180 seconds) before starting its processing.

> **Note:** The thresholds, momentary processing time, and desired FLISR mode in this scenario can be configured using the **FLISR Voltage Loss Thresholds** SRS rule. Substation restoration delay time can be configured using **FLISR Sub-Station Restoration Delay** SRS rule.

Understanding FLISR Blocking Conditions

NMS may be configured with conditions to block FLISR actions when present. Any FLISR regeneration plan that would include the condition will be excluded from automatic actions or from suggested restoration plans.

Possible Blocking Scenarios

- Blocking could be set up for a type of safety document and then FLISR would skip any scenario that would operate a device that had been tagged with that type of safety document.
- Any device with a crew on-site could be blocked to protect the crew from an automatic device operation.
- Any device tagged with the *FLISR Feeder Disable* condition will disable the feeders to which the device is connected. FLISR will skip any scenario that involves these feeders.

  Note: In the product OPAL (demo) model, the FLISR Feeder Disable condition can be added on a device using the Control Tool's **Hot-Line Tag** button.

Understanding Sensitive Earth Fault Processing

In the event of the sensitive earth fault, FLISR only restores the downstream section of the fault. FLISR ignores the downstream fault indicators and assumes that the fault is below the device reporting the sensitive earth fault.

Some networks may have devices that cannot reliably report the sensitive earth fault. There are also some devices that can be relied upon when they report the absence of sensitive earth fault, but cannot be trusted upon when they report the presence of sensitive earth fault. FLISR is able to recognize such devices and skip them while determining the isolation and restoration switches.

Setting the System FLISR Mode

FLISR supports four different modes of operation:

- **Disabled:** Disables FLISR from calculating, generating or executing a restoration solution. FLISR still automatically performs disables/enables functions.
- **Manual:** Places FLISR in manual mode, where restoration solutions are automatically generated but must be manually executed by the operator via a switching sheet generated from the FLISR tool.
- **Automatic:** Places FLISR in automatic mode, which automatically generates and executes switching sheets.
- **Restore Only:** Places a feeder in FLISR Restore Only mode, which allows the feeder to be used for restoration for faults occurring on connected feeders, but not for faults on the feeder.
- **Disabled (Load Shed):** This FLISR mode is set when a designated SCADA measurement is asserted; it disables FLISR for entire NMS instance. When the SCADA measurement is de-asserted, the systems sets FLISR back to its previous mode. When the FLISR mode is set to **Disabled (Load Shed)**, you cannot change the FLISR mode to **Manual** or **Automatic** (using the Web Workspace **Tools** menu); you can only change the mode to **Disabled**, so that when the measurement is de-asserted, the FLISR mode stays **Disabled**.

To set the FLISR mode, from the Web Workspace **Tools** menu, select **DMS Settings**, then select **FLISR Mode**, and then select the desired mode (**Disable**, **Manual**, or **Automatic**). These modes (and **Restore Only** mode) can be set for individual feeders through the Configuration Assistant's Feeder Management tab (see **Using the Feeder Management Tab** on page 24-32 for details). In effect, FLISR will run the minimum of the system wide mode and feeder mode.

FLISR can also be configured for phase-operable mode. By default, FLISR phase-operable mode is off, but it can be set using the 'FLISR Single-Phase Mode' SRS-rule (see **Using the Event Management Rules Tab** on page 24-16). The rule may be set to the following values:

- **0:** ganged mode.
- **1:** for un-ganged mode minimizing momentary faults. This is a make-before-break mode where FLISR creates a parallel on the non-faulted phases before opening the downstream isolation switch. However, this approach has the potential to cause the neutral imbalance on the restoring feeder. If the negative neutral current goes above the threshold, it causes the neutral-over current relay to trip. To avoid such scenarios, FLISR evaluates its restoration plans and, if the plan has potential to cause the neutral-imbalance, it opens the downstream isolation switch in all three phases just as in mode 2 described below.
- **2:** un-ganged mode avoiding making parallels on the faulted feeder. In this mode, downstream isolation switch is opened in all three phases before closing the restoration switch.

FLISR single-phase mode operation relies on the presence of phase-operable devices. When the tripped breaker is ganged operated, FLISR treats the event as a 3-phase outage event. However, if phase operable devices are present below the tripped breaker, FLISR can use them for single-phase operation if the **FLISR Enable Single Phase Operation**

on Ganged Trip SRS-rule is set to `yes`; see **Using the Event Management Rules Tab** on page 24-16 for information on setting rules.

Understanding the Number of Retries for a Timed Out Step

If no response (related to a switching action) from SCADA is received within the configured timeout period, then the switch step status will be set to a value of *Failed*. When the FLISR plan is executed in automatic mode or when the plan is manually executed using the **Execute the entire plan** toolbar option, the plan execution can retry a timed out step for a configurable number of times before it sets the switch step status to *Failed*.

Configuring the Number of Retries for a Timed Out Step (Administration Users)

To allow the plan to retry the actions when they time out, configure the rule **DMS Switching Step Fail Retries and Wait Time** in the Configuration Assistant **Event Management Rules** tab's **DMS Application Rules** tree.

> **Note:** The rule may be searched for or you may expand **DMS Application Rules** and then **SCADA Measurement Rules**.

Add an instance of this rule for **FLISR** plans. Configure the following:

- **rule_value_2:** Enter the FLISR sheet class (found in the SWMAN_SHEET_CLS table).
- **rule_value_integer_1:** Enter the maximum number of retries to perform before setting the step as *Failed*.
- **rule_value_integer_2:** Enter the time to wait before retrying the action.

See **Using the Event Management Rules Tab** on page 24-16 for more information on configuring rules.

Understanding the FLISR Plan Execution Time Limit

FLISR switching sheets can be automatically executed both in manual or automatic mode. An Event Management (SRS) rule (`FLISR Plan Execution Timeout`) is configured to control the maximum amount of time a FLISR switch sheet is allowed to automatically execute. If a sheet execution time exceeds the time limit, then the sheet execution will be stopped, the sheet state will be changed to **Timeout**, and the associated FLISR event's DMS status will be changed to **FLISR (M) Plan Execution Timed Out** or **FLISR (A) Plan Execution Timed Out** (depending on the FLISR mode).

> **Note:** The default value is 600 seconds.

Enabling and Disabling FLISR Devices from the Control Tool

You can enable or disable devices for FLISR actions by clicking the **Enable FLISR** or **Disable FLISR** buttons from the Control Tool. These buttons are displayed for all FLISR devices.

When a FLISR device is disabled, a condition flag is shown on the Viewer adjacent to the device.

> **Note:** Disabling a Circuit Breaker or a Recloser will implicitly disable all downstream FLISR actions. Disabling a non-reclosing device (that is, a simple sectionalizer) will only disable the individual device.

Understanding FLISR Events in the Work Agenda

The Work Agenda **DMS Status** column provides information about FLISR status and results of the FLISR calculations. When row or cell coloring is enabled in the **Web Workspace** (see **Understanding the Table Settings Menu** on page 2-9 and **Understanding Conditional Formatting** on page 2-18), the **DMS Status** information is color coded (see **Conductor Symbology** on page D-5 for color coding values). Possible FLISR status results:

DMS Status Column	Description
	Blank. A non-DMS event.
FLISR Solution in Progress	The event is currently being processed as a FLISR event and is searching for a solution.
FLISR Demand and Scan in Progress	FLISR is currently scanning the network to find the relevant SCADA devices.
FLISR Solution Failed	There were issues finding a FLISR solution. Possible causes include invalid devices, model issues, invalid fault indication, loop in faulted section, and so on.
FLISR No Solution Found	No FLISR solution could be found for the fault event.
FLISR Solution Generated	A FLISR solution has been found for the event.
FLISR Solution Generated with Violations	A FLISR solution has been found, but it causes violations on the restoring feeder – manual intervention is required.
FLISR Plan Executing	The system is executing the plan.
FLISR Plan Executed	The system has finished executing the plan.
FLISR Plan Execution Failed	The plan failed to execute – manual intervention is required.
FLISR Tags Found	Tags were found on the affected feeder.
FLISR Manually Aborted	FLISR processing or execution has been aborted by a user.
FLISR Aborted	FLISR is aborted due to multiple faults on the same feeder.
FLISR Plan Execution Timed Out	FLISR plan execution time exceeded the configured time.

Note: The preceding statuses will indicate the mode in which FLISR attempted to process the fault event by appending either **(M)** or **(A)** for Manual or Automatic, respectively.

Aborting a FLISR Plan from the Work Agenda

Select a FLISR event in the Work Agenda. Right-click the event and select **Abort DMS Processing**. Alternatively, in the FLISR switching plan, right-click the FLISR event in the Events table and select **Abort DMS Processing**.

Using the FLISR Report Tab in Event Details

The FLISR Report tab summarizes the SCADA devices and their signals and the recommended restoration solutions. To open the **FLISR Report** tab:

- Select a FLISR event in the Work Agenda. Right-click and select **FLISR Report...** from the context menu. The Event Details window opens for the selected event.

  Note: These options are only available if the selected event is a FLISR event.

The **FLISR Report** tab displays the following information:

- **SCADA Measurements**. This summarizes the status of all FLISR devices downstream of the tripped device.
  - **Device** displays the alias of the device.
  - **Status** displays the tripped/closed status of all associated SCADA devices.
  - **Pre-Trip Amps** displays the pre-fault amps through the associated SCADA devices. This is calculated from the pre-fault kW and pre-fault kVAr.
  - **Fault Indicator** displays the fault indication status of all associated SCADA devices. The value of fault indicators can be anything from **N/N/N/N** to **Y/Y/Y/Y**. Where **N/N/N/N** indicates that fault indicators are off for all the phases (A/B/C/N) and **Y/Y/Y/Y** indicates that fault indicators are on for all the phases. Similarly, **F/F/F/F** indicates that SCADA failed to report the fault indicators and value **N/A** indicates that fault indicators are not available on that device.
  - **Lockout Indicator** displays the reclose lockout status of all associated SCADA devices. The value of lockout indicators can be anything from **N/N/N/N** to **Y/Y/Y/Y**. Where **N/N/N/N** indicates that lockout indicators are off for all the phases (A/B/C/N) and **Y/Y/Y/Y** indicates that lockout indicators are on for all the phases. Similarly, **F/F/F/F** indicates that SCADA failed to report the lockout indicators and value **N/A** indicates that lockout indicators are not available on that device.
  - **Pre-Trip kW** displays the pre-fault kW through all associated SCADA devices.
  - **Pre-Trip kVAR** displays the pre-fault kVAr through all associated SCADA devices.
  - **Quality** displays the relevant SCADA status of the associated SCADA device's status, reclose lockout, fault indication, and analog signals.
- **FLISR Messages.** Summarizes pertinent information associated to the plan such as tags found, reasons for failure, execution details such as solution start/end times, FLISR sheet creation start/end times, sheet execution start time, status and end time. Message description strings are preceded by a unique 4-digit code, which indicates the point in the FLISR execution that the associated message was generated.
  - **Device** displays the alias of the device for which the message is associated to. For example, if a downstream switch had a tag associated to it the switch alias would appear here.
  - **Date** displays the time stamp related to corresponding message.

- **Is Alarm** displays whether this message is an alarm (Y) or not (N).
- **Message Description** displays a string with information for that row entry. Examples include reasons for failure, tags found, information about plan execution, sheet id, event id, and so on.

- **FLISR Solutions**

FLISR will try to resolve the problem in several ways. It's overall objective is to restore as many customers as possible, without incurring voltage or flow violations and using the minimum number of switching steps.

By default, FLISR prefers to find a plan with restoration feeders on the same substation transformer bank and with maximum capacity. However, FLISR plan preferences can be customized using the **FLISR Plan Preferences** SRS rules in Configuration Assistant's **Event Management Rules** tab (see **Using the Event Management Rules Tab** on page 24-16).

> **Note:** The full description of the rule is available in the rule's documentation pane in the Configuration Assistant (see **Documentation Pane** on page 24-19).

FLISR's mode of operation is **Single-Tier**, where all restoration is done using immediately adjacent feeders (and, if possible, the tripped device). If viable a single-tier plan is found, then it will be presented in the **FLISR Solution** section of the **FLISR Report**.

If there is no viable single-tier solution, FLISR will (if configured) search out to further feeders (or tiers) to see if it can transfer load away from the neighboring feeders and create enough capacity to restore the non-faulted sections. In doing this, it will also consider splitting up the sections downstream of the fault and restoring via different paths. If no viable multi-tiered solutions are found, the best single-tier options are offered.

Multi-tiered searching can be activated with the **FLISR Number of search tiers** rule. Setting that rule to 1, will constrain FLISR to single-tiered solutions only.

Single-Tier and Multi-Tier solutions are presented in separate tabs in the **FLISR Solutions** pane of the **FLISR Report**. The **Multi-Tier** tab is only present if FLISR had to revert to multi-tier, and was able to find a viable solution.

When the **Multi-Tier** tab is present, the **Single-Tier** tab is for reference only and is there to allow you to review the reasons why Single-Tier solutions are not viable. If the Multi-Tier plan is found, then it is no longer possible to generate the Single-Tier plans, clicking the **Generate Switch Plan** button will trigger the Multi-Tiered switch plan to be generated.

If Multi-Tier solutions are also not viable within the search area, the application reverts to showing just the best **Single-Tier** plans and allows you to resolve the blocking conditions.

The columns listed in the Single-Tier solution table are:

- **Open Switch** displays the alias of the SCADA device used as the isolation point, in the FLISR-generated restoration solution.
- **Open Phases** displays the phases of the isolation switch that are opened to isolate the fault on the feeder. This column is visible only when FLISR is set for un-ganged operation.

- **Preferred Close Option** column allows you to select the desired restore switch option for this isolation switch. The selection can only be changed if the isolated section has not had a restoration sequence written to a switch plan. If all sections have been written to a plan, this columns is hidden.
- **Execution Mode** reports if a switch has been utilized in manual or automatic mode. Once one switch in a block has been used, the option to change the Preferred Switch for that block is disabled.
- **Other Sub-Station Switches to Close**, in case of a sub-station fault, lists sub-station switches that FLISR will close to restore the sub-station area.
- **Rank** reports the order in which FLISR ranked the restoration options.
- **Pickup Amps** displays the expected amps (load) in the section bounded by the isolation switch, which is to be transferred to another feeder.
- **Close Switch** displays the alias of the SCADA device used as the restoration point in the FLISR-generated restoration solution.
- **Close Phases** displays the phases of the restoration switch that are closed for restoration. This column is visible only when FLISR is set for un-ganged operation.
- **Feeder** displays the feeder name to which supply is being transferred.
- **Peak Load Time** displays the time of load reported for consideration. This would be peak load after the restore.
- **Before Feeder Amps** displays the amps on the feeder to which supply is being transferred.
- **After Feeder Amps** displays the expected amps (load) on the feeder to which supply is being transferred after the transfer.
- **Violation Start Time** displays the time that feeder violations start, if applicable.
- **Violation End Time** displays the time that feeder violations end, if applicable.
- **Limit Device** displays the highest loaded limiting object type.
- **Expected Limit Object Amps** displays the expected highest loaded limiting object amps after the restoration.

The **Multi-Tier** solution table lists the same columns (with the exception of **Rank** because Multi-tiered switching **only** presents the optimal restore switch) and adds the following:

- **Action** displays a high-level description of what FLISR is doing with the actions. Possibilities are:
  - **Upstream Restore:** There is a SCADA switch between the tripped device and the faulted section that can be opened, allowing for the tripped device to be closed and restoring customers upstream of the fault.
  - **Downstream Restore:** A section downstream of the fault can be isolated and restored
  - **Downstream Split And Restore:** A section downstream of the fault can be split up (with an open action) and then the sections can be restored independently (usually via different pickup feeders).

- **Load Transfer:** A section of feeder that needs to be moved to create capacity to allow for restoration. This section is not presently involved in the fault and will therefore be moved with make-before-break actions.

FLISR Report Tool Menus and Toolbar

This section describes the toolbars and menu options available when you are running FLISR.

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the Print Preview dialog box, which allows you to print the **FLISR Report** tab. See **Taking Authority for Control Zones** on page 2-24 for details on using Print Preview.	

Actions Menu

Menu Option	Description	Toolbar Icon
Generate Switch Plan	Generates a switch plan for the selected isolate/restore sequences when FLISR is in Manual mode or when a plan resulting in a violation is detected under Auto mode.	
Enable Details Balloon	Toggles the details balloon on and off. When enabled, a balloon dialog box displays details about the selected item. For Limit Devices, the balloon dialog box displays the Limit Device Amps,% of Rating, and Margin.	
Analyze	Loads the post fault network conditions in the viewer study mode as a *Save Case*, which includes the device statuses, analog SCADA measurements, and weather conditions. It also automatically opens the Suggested Switching wizard with faulted device selected. The Suggested Switching wizard is set up for isolation and restoration to analyze the FLISR plan using only SCADA devices. For more information on Save Cases, see **Using the Save Case Management Tool** on page 2-94.	

Context Menu Actions

The following context menu options are displayed when you right-click a row in the FLISR Report tool.

- **View...:** Focuses the Viewer on the selected device.
- **SCADA Summary...:** Displays the SCADA Summary window for the selected row in the SCADA Measurements table.
- **Flow Summary...:** Opens the FLISR Flow Summary. This option is only available when a row is selected in the FLISR Solutions list.
- **View Isolate Switch...:** Focuses the Viewer on the affected feeders for the selected isolate sequences. This option is only available for the selected row's isolation switch.
- **View Restore Switch...:** Focuses the Viewer on the affected feeders for the selected restore sequences. This option is only available for the selected row's restoration switch.
- **View Limit Device...:** Focuses the Viewer on the highest expected limiting device for the selected restore sequence.

Executing FLISR in Automatic Mode

In Automatic mode, FLISR can create and execute a switch plan without operator intervention as follows:

1. A fault occurs and a section is isolated.
2. FLISR completes its analysis and produces its solutions.
3. FLISR selects the best combination, based on a set of rules such as preferring to restore load to the same Zone Substation and avoiding violations.
4. FLISR creates a plan and executes all steps in the plan automatically. The newly generated plan's **Request** tab will be populated with all relevant device related data.
5. An operator can view the plan during and after execution. If the switching sheet is called up during the automatic execution, it will have been placed in View Only mode. The switching sheet may be manually augmented with additional steps after the automatic execution has completed. The switching sheet will behave like a normal Fault switching sheet after the FLISR generated steps are completed or have failed (after it is taken out of View Only mode).

After FLISR calculations have been made, the corresponding switching sheet may be called up from the **Switching…** option in the Work Agenda. It is possible that when you call the switching sheet up you will see the switching sheet still executing.

FLISR Automatic Mode with Violations

FLISR automatic mode with violations works as follows:

1. A fault occurs and a section is isolated.
2. FLISR completes its analysis and produces its solutions. One of the preferred restoration scenarios includes creating violations on the restoration feeder.
3. FLISR selects alternate restoration scenarios. This might mean skipping a preferred feeder to avoid the violations and selecting a different feeder that has more capacity. When FLISR estimates voltage and loading violations on the preferred feeders post restoration and if the violations are not worse than pre-fault at the same locations, then the plan will be allowed to execute automatically.
4. A plan is created and all steps in the plan are executed.
5. An operator can view the plan during and after execution as described above.

Generating a Switch Plan for the Violation Case

In the case where the restoration plan would result in violations, either in the restoring feeder or the section being transferred, the user must apply an override to generate the Switch Plan.

The check box must be selected for the solution you want to use. The system prompts you for confirmation. In automatic mode, plans with violations are not executed automatically and must be run by the user manually (from the switching sheet via the **Execute Entire Plan** action).

Generating a Switch Plan with FLISR in Manual Mode

In manual mode, you can generate a switching sheet from the FLISR tool and then execute the steps in Web Switching Management.

Here's how the process works:

1. A fault occurs and a section is isolated.
2. FLISR completes its analysis and produces its solutions.
3. The operator inspects the FLISR solutions and either accepts the default scenarios or decides to adjust the scenarios.
4. The operator instructs FLISR to generate the plan. The newly generated plan's **Request** tab will be populated with all relevant device related data.
5. The operator reviews the plan.
6. The operator can choose to do one of the following:
    - Instruct, Complete and/or fail each step manually, or
    - Choose to let FLISR execute all steps in the plan.

Generating the Switch Plan

To generate the switching sheet from the Fault Location, Isolation, and Service Restoration window, follow these steps:

1. In the FLISR Solutions table, click the check box for the plans you want to generate. (The check box appears in the column to the right of the Isolate Switch column.)
2. Click the **Generate Switch Plan** toolbar button or select **Generate Switch Plan** from the **Actions** menu. The switching sheet is displayed, with the switch steps already inserted.

    Note: If there is an existing sheet already associated with this FLISR outage, the FLISR Event to Sheet List dialog box opens. Choose a sheet from the list. Indicate whether the steps should be appended to the existing plan and whether the existing sheet should be overwritten. The switching sheet will be displayed with the FLISR-generated steps, based on the options selected.
3. From the Switching Sheet Editor, click one of the following buttons on the **Steps** tab toolbar.

    - **Execute Entire Plan** ( ): Executes all FLISR switch steps after prompting for confirmation. Note that separate isolation/restoration sequences will be executed in parallel. While the switching sheet steps are being executed, the switching sheet will be placed in View Only mode. Once the automatic execution has completed, steps may be manually added to the switching sheet. (The switching sheet behaves like a standard Fault switching sheet once the FLISR generated steps have completed or failed, and it is taken out of View Only mode.)
    - **Clear FLISR Conditions** ( ): Clears the FLISR operated Flags from the Viewer for this Switching Sheet.

Viewing FLISR Conditions

FLISR Conditions (that is, FLISR Actions and FLISR Disabled Devices) are listed in the **Condition Summaries**, which is accessed from the **Tools** menu. See **Condition Summaries** on page 2-134 for additional details on the Condition Summaries window.

Viewing FLISR Actions

To view all FLISR Actions, select **FLISR Actions** from the Condition Summaries Filter menu. The FLISR See **Condition Summaries** on page 2-134 for more information.

Viewing FLISR Disabled Devices

The system allows you to view devices that have been individually disabled from FLISR operations. There are several scenarios for disabling FLISR on a device.

- Devices can be enabled/disabled through actions on the device's control tool
- Disabling a circuit breaker (and/or recloser) automatically disables all downstream devices along a radial feeder. Each device is checked during FLISR execution for upstream disabled breakers or reclosers.
- Disabling a sectionalizer disables just the individual device.
- Suppressing reclose features of a recloser or circuit breaker will also disable FLISR on the device.
- An explicit FLISR Disable SCADA point can be mapped to a device. When set (typically through a SCADA calculated point), FLISR will be disabled on that device.
- A device can be disabled in multiple fashions; only when all disabling conditions are removed will the device become active again.
- A device can only be enabled by removing the corresponding disabling constraint. For example it is not possible to manually enable a device that has been automatically disabled due to reclose suppression.
- Disabled devices are marked with a "FLISR Disabled" condition, shown in the Viewer, and summarized in the Condition Summaries window with the FLISR Disabled filter.

Using the FLISR Flow Summary Window

The FLISR Flow Summary window displays the calculated flows in the restoration path and in the de-energized section that will be transferred.

To open this window, right-click a row in the FLISR Solutions section of the Fault Location, Isolation, and Service Restoration window, then select **Flow Summary...** from the context menu.

The Flow Summary window displays the following fields and buttons:

- **Device Name** is the alias of the object in the restoration path or de-energized section.
- **Device Type** is object type: Cond = conductor, Switch = switch, Fuse = fuse.
- **Amps Flow A/B/C** is the flow in amps through the object.
- **Amp Limit A/B/C** is the limit in amps for the object.
- **Largest % Usage** is the expected load flow through the object as a percentage of the object's rating.
- **Smallest Margin** is the available capacity in amps for the object.
- **kV A/B/C** is the kV on the branch.
- **Low Limit** is the low kV limit.
- **High Limit** is the high kV limit.
- **% Nominal A/B/C** is the percentage of nominal voltage that branch is being run at.
- **Violation Type** is type of violation, if any, on the branch. The violation type drives the coloring of the device name column. Devices that violations are colored red. Devices that have warnings are colored yellow. Devices that have neither violations nor warnings are colored green.
- **Violation Status** indicates the status of the voltage and loading violations on the object post restoration. FLISR compares the estimated violations on the object post restoration with its pre-fault violations and displays the status. The status may be one of the following: better, same, worse, or added. When FLISR is in automatic mode and only voltage and loading violations exist in its plan and if the violations are not worse than pre-fault, then the plan will be allowed to execute automatically.
- **Violation Start Time** displays the time that violations start.
- **Violation End Time** displays the time that violations end.
- **Restored Device** is set to 'Y' if the object is part of the faulted (de-energized) feeder or 'N' if it is part of the restoring feeder.
- The **Focus** toolbar button displays the branch flow in the Viewer, with the selected object flashing.

Optimizing the Network with FLISR Preferred Plan

When there is a fault, FLISR comes up with a plan to isolate the fault and restore the sections of network around the fault. If the analysis shows that the preferred plan will leave voltage and/or flow violations, FLISR will attempt to alleviate these by performing a Volt/VAr optimization. If the objective is achieved, it will add the steps found by the optimization on the Volt/VAr devices.

FLISR performs the optimization only when the Optimization module is licensed and the Optimization global status is enabled (set to either **Manual** or **Automatic**). You can also control whether FLISR performs Volt/VAr optimization by setting a configurable parameter (`flisrOptimizeNetwork`) in the Configuration Assistant Event Management Rules tab's Fault Location, Isolation, and Service Restoration rules tree. The `flisrOptimizeNetwork` parameter's rule_value_1 is set to yes by default. You can set the rule_value_1 to '`no`' if FLISR should not perform optimization.

FLISR also needs to use powerflow as its solution engine to run optimization

> **Note:** See the Configuration Assistant chapter's Using the Event Management Rules Tab section for details on how to set flisrSolutionEngine in Configuration Assistant.

When optimization relieves the violations, the recommendations on Volt/VAr devices will be added to the FLISR switching sheet when generated. These recommendations are not seen on the FLISR report, but a message is added to the report saying optimization steps have been added to the plan.

When FLISR is in automatic mode and optimization global is in manual mode, the FLISR plan will be demoted to manual if optimization has added recommendations to the FLISR switching plan.

Chapter 19

Fault Location Analysis

Oracle Utilities Network Management System's Fault Location Analysis (FLA) uses fault-related SCADA measurements to identify probable fault locations. This information can be used to dispatch crews to targeted locations, thus shortening outage duration and restoration time.

> **Note**: Fault Location Analysis is only available if your system supports SCADA extensions.

This chapter covers the following topics:

- Fault Location Process Overview
- Using Fault Location Analysis

Fault Location Process Overview

The Fault Location process is as follows:

- When the system receives a message of a fault occurrence, the FLA automatically retrieves fault information from relays and fault indicators (if available) and logs a new event in the Work Agenda.
- FLA uses fault information and circuit parameters to calculate potential fault locations for fault events. Potential fault locations are displayed in the Viewer.
- When the FLA tool is started, it displays analysis details about fault events, including SCADA measurements and probable fault locations.
- If more than one fault location is identified for a specific fault event, the user may have to correct a calculated fault location after the actual fault location is identified by crew members on site.

Fault Location Algorithm

The algorithms used by FLA are different from those used for a regular short-circuit analysis. When performing a short-circuit analysis, where you are determining fault currents, you have more information since you know where the fault is. In that case, the model is solved with a known fault type at a known location. The fault currents at the target location are determined by the source voltage, source impedance, and all conductor impedances along the path to the fault.

With FLA, only the fault currents at the fault reporting device are known and the fault location must be extrapolated. If available, FLA can utilize fault voltage recorded at fault reporting device in conjunction with the fault currents to further improve the analysis.The short-circuit analysis is performed with the fault placed at the breaker and the fault currents determined for that scenario. These should be higher than the fault currents reported by SCADA. For example, if SCADA is reporting 2500 Amps at the breaker and the solution is reporting 3000 Amps, we know that there is more impedance in the path to the fault that would account for the 500 Amps difference. We calculate the impedance that would cause the difference and trace down the feeder summing up conductor impedances until we arrive at a location that equates to the target impedance.

One significant difference between the two scenarios is that by placing the fault at the breaker, we are removing all downstream load from consideration. Whereas in FLA, the fault is actually downstream, so the breaker fault currents will have a component that is for the load that is between the breaker and the fault. The assumption that is made is that component is insignificant; however, in reality, the further down the feeder the FLA fault is, the more significant that component becomes. This may or may not have a significant impact on the results because the fault will pull down the breaker voltage.

Using Fault Location Analysis

FLA displays possible fault locations and the SCADA data involved in the fault location analysis. You can also use the tool to confirm or discard calculated locations.

This section includes the following topics:

- Understanding Fault Events in the Work Agenda
- Using the Fault Location Analysis Tool
- Confirming Fault Locations
- Marking Fault Locations as Incorrect
- Correcting a Fault Location
- Isolate and Restore Option for a Confirmed Fault
- Configuring Individual Feeders for FLA

Understanding Fault Events in the Work Agenda

When the system receives a message of a fault occurrence, the FLA automatically retrieves fault information from relays and fault indicators (if available) and logs a new event in the Work Agenda. The Work Agenda fault event provides the following information:

- The **Status** column displays "F-NEW."
- The **# Out** column (number of customers experiencing outage) is 0.
- The **DMS Status** column will list one of the following depending on fault type.

  Momentary Faults

  - FLA (M) Solution in Progress
  - FLA (M) Locations Found
  - No FLA (M) Locations Found
  - FLA (M) Solution Failed

  Sustained Faults

  - (S) Solution in Progress
  - FLA (S) Locations Found
  - No FLA (S) Locations Found
  - FLA (S) Solution Failed

  Note: When fault locations are corrected, the system will determine percentage accuracy of the predicted fault location to the actual fault location. This information will be appended to the data in the DMS Status column description.
- The **Evt Type** is "FAULT."
- The **Prediction Type** is "Revised Prediction."
- No phases are listed as out.
- All device-related fields, such as the control zone information, appear as they would for any other event.

You can treat the event like you would other event types in the Work Agenda (for example, acknowledge, assign crews, and so on). In addition, the Work Agenda allows you to start the FLA tool when a fault event row is selected by selecting **Fault Location Analysis...** from either the Work Agenda **Actions** menu or the right-click context menu.

Using the Fault Location Analysis Tool

The Fault Location Analysis tab displays possible fault locations and the SCADA data involved in the Fault Location analysis.

Menu and Toolbar Options

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the Print Preview dialog box allowing you to print the Fault Location Analysis data.	

Actions Menu

Menu Option	Description	Toolbar Icon
Isolate and Restore...	Opens the Suggested Switching wizard to generate a switching sheet with the **Isolate and Restore** option selected by default. See **Isolate and Restore Option for a Confirmed Fault** on page 19-9 for information.	
Display Fault Locations...	Displays the fault locations of the active event in the viewer. If there is more than one possible location, the viewer zooms out to show all locations, and Big Symbols is enabled.	
Hide other Fault Locations...	Displays the fault locations of the active event in the viewer and hides the fault locations of all other events.	
Hide Fault Locations...	Hides the fault locations for the event in the Viewer.	

The Fault Location Analysis tab displays three sections:

- The **SCADA Measurements** section displays fault-related SCADA measurements used to identify probable fault locations.
- The **FLA Messages** section summarizes information associated with the fault location analysis. The information that could be presented include reasons for failure, status, and execution details such as solution start/end times.
- The **Possible Fault Locations** section displays the list of devices identified by the Fault Location Analysis tool as possible fault locations. If no valid fault locations are found, a single "Undetermined Fault" record is listed.

SCADA Measurements Section

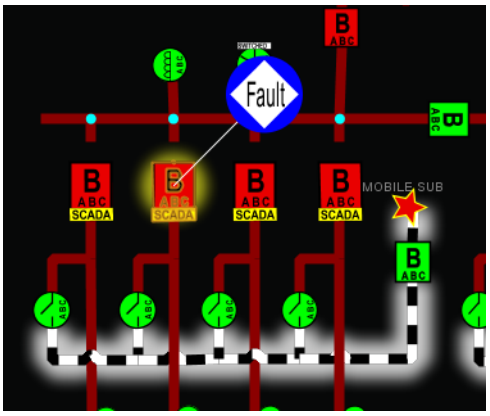
Table Data

- The **Device** column contains the name of the device reporting the SCADA measurements.
- The **Status** column contains the status of the device.
- The **Fault Indicator** column contains the fault indicator. The value of fault indicators can be anything from N/N/N/N to Y/Y/Y/Y. Where N/N/N/N indicates that fault indicators are off for all the phases (A/B/C/N) and Y/Y/Y/Y indicates that fault indicators are on for all the phases. The column indicates whether the fault current values for that device should be processed for the phases for which fault indicators are on. The fault current may trigger fault location analysis even without a breaker trip.
- The **Lockout Indicator** displays the reclose lockout status of all associated SCADA devices. The value of lockout indicators can be anything from N/N/N/N to Y/Y/Y/Y. Where N/N/N/N indicates that lockout indicators are off for all the phases (A/B/C/N) and Y/Y/Y/Y indicates that lockout indicators are on for all the phases. Similarly, F/F/F/F indicates that SCADA failed to report the lockout indicators and value N/A indicates that lockout indicators are not available on that device.
- The **Qual** column contains quality codes for the measurement that indicate the quality of the SCADA measurement (for example, out of scan, inhibited, manual override). Several quality codes may be listed.
- The **Amps** columns contain the calculated current flow from the source.
- The **kV** columns contain the voltage at the fault reporting device at the time of the fault. These are optional measurements and may not be configured for all projects.

Context Menu

If you right-click to select a row in the SCADA Measurements section, the context menu displays the following options:

- **SCADA Summary...** - Launches the SCADA Summary filtered for the selected device.
- **View...** - Displays the device in the Viewer.



FLA Messages Section

Table Data

- The **Device** column displays the alias of the device to which the message is associated.
- The **Date** column displays the time stamp for the message.
- The **Is Alarm** column displays whether the message is an alarm (Y) or not (N).
- The **Message Description** column displays information about the row. The message description begins with a unique message identifier that indicates where in the FLA process the message was generated.

Context Menu

If you right-click to select a row in the FLA Messages section, the context menu displays the following option:

- **View...-** displays the device in the Viewer.

Possible Fault Locations Section

Table Data

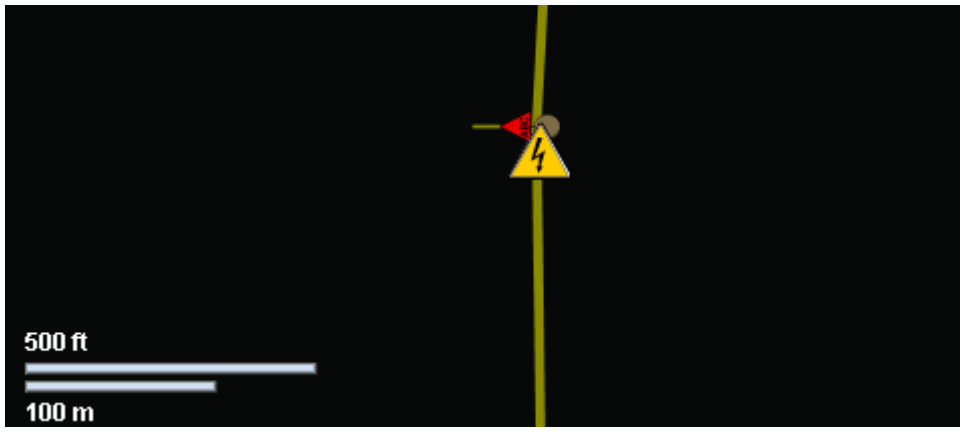
- The **Status** column contains the status of the fault location: Possible Fault, Confirmed Fault-Out, or Fault Incorrect.
- The **Fault Type** column contains the fault type: Phase A to Ground, Phase A to Phase C, and so on.
- The **Fault Device** column contains the fault device name.
- The **Phases** column contains the faulted phases.
- The **Location** column contains distance from the device to the upstream switch.
- The **Total Distance** column is the total number of feet from the device that reported fault current.
- The **Coordinate** column contains the coordinate of the predicted fault. If the model is configured to be spatially enabled, this column will convert the GIS coordinates to latitude/longitude. (See "Spatially Enabling the Data Model for Advanced Spatial Analytics" in chapter 8, System Data Model, of the *Oracle Utilities Network Management System Configuration Guide* for details.)

Context Menu

If you right-click to select a row in the **Possible Fault Locations** section, the context menu displays the following options:

- **Confirm Fault:** Marks the device as Confirmed and marks all other devices in the list as Incorrect (not the correct fault location). See **Confirming Fault Locations** on page 19-7.
- **Mark Incorrect:** Marks the devices as Incorrect (not the correct fault location). See **Marking Fault Locations as Incorrect** on page 19-7.
- **Correct Fault…:** Displays the Correct Fault Location window, which allows you to manually edit the fault location. See **Correcting a Fault Location** on page 19-8.

- **View...:** Displays the selected device in the Viewer.
- **Isolate and Restore...:** Opens the Suggested Switching Wizard to isolate the faulted area and restore the rest of the feeder. See the **Isolate and Restore...** on page 19-4 description in the Actions Menu section for details.



Confirming Fault Locations

To confirm a fault location:

1. Select the device you want to confirm from the Possible Fault Location section on the Fault Location Analysis window. (See **Using the Fault Location Analysis Tool** on page 19-4.)
2. Right-click and select **Confirm Fault** from the option menu. The selected device is marked as Confirmed and all other devices in the list are marked as Incorrect.

   The Confirmed Fault changes from to in the Viewer. The other Incorrect faults disappear from the Viewer.

   Note: The options are also available when you right-click a fault location symbol in the Viewer.

Marking Fault Locations as Incorrect

To mark a possible fault location as incorrect:

1. Select the device you want to mark as incorrect from the Possible Fault Location section on the Fault Location Analysis window. (See **Using the Fault Location Analysis Tool** on page 19-4.)
2. Click the right mouse button and select **Mark Incorrect** from the context menu. The selected device is marked as Incorrect and disappears from the Viewer.

   Note: The options are also available when you right-click a fault location symbol in the Viewer.

Correcting a Fault Location

If none of the possible fault locations is correct, you can select the closest one and then correct the fault location details. The system creates a new fault location with the corrected information.

To correct a fault location:

1. Select the closest fault location from the Possible Fault Location section on the Fault Location Analysis window. (See **Using the Fault Location Analysis Tool** on page 19-4.)
2. Right-click and select **Correct Fault…** from the context menu. The Correct Fault Location window is displayed. The Status of the new fault location is set to Corrected Fault and is not editable.
3. Enter the correct values for the following fields:
    - **Fault Type** - The specific fault type, such as Phase A to Ground or Phase C to Phase A.
    - **Fault Device** - The faulted object. This is the device alias for the conductor selected in the Viewer.
    - **Distance** - The distance to the referenced device.

    Note: The reference device field populates with the first upstream switch. The system automatically displays the first upstream switch for the selected fault device. You can reference a different device by selecting the device in the Viewer and clicking the **Change Reference Device** button on the Correct Fault Location dialog box; the Select Reference Device dialog box is displayed. The system populates the Reference Device field with the selected device in the Select Reference Device dialog box. Click **OK** to accept this device or click **Cancel** if this is not the correct device.

    - **Description** - A brief description of the fault. This text will be displayed in a balloon dialog box on the Possible Fault Locations table for Corrected Fault rows.
4. Click **OK**. All existing fault locations are flagged as incorrect, and a new location is added that matches your entries.

    A new fault location symbol appears in the Viewer at the location indicated by the Distance and Reference Device fields. Any existing fault location symbols in the Viewer are removed.

    Note: The options are also available when you right-click a fault location symbol in the Viewer.

Isolate and Restore Option for a Confirmed Fault

When a fault location has been confirmed, the Isolate and Restore option allows you to use Suggested Switching to generate a switching plan to isolate the faulted section and restore the rest of the feeder.

> **Note:** You must have privileges for DMS applications in Study Mode to have access to the Isolate and Restore option.

1. In the Possible Fault Locations table, select the row with the confirmed fault.
2. Select **Isolate and Restore...** from either the **Actions** menu or right-click to select it from the context menu. If you already have an active study session, the Reset Study Session dialog box will open.
3. In the Reset Study Session dialog box, click **Yes** to reset the study session to the real-time parameters. The Viewer will update to show the fault location and the Suggested Switching wizard will open with Isolate and Restore selected. See Chapter 13, Suggested Switching for details.

Manually Entering Fault Current from the Control Tool

You may manually enter SCADA fault data to have FLA calculate a fault location.

1. Launch the Control Tool for the breaker.
2. Click the **Fault Current...** button.
3. In the Fault Current dialog box, enter the SCADA fault current data.
4. Click **OK** to close the dialog box and initiate the FLA calculation.

A new Fault event will be initiated and the fault indicators will be displayed in the Viewer.

> **Note:** Click **Cancel** to close the Fault Current dialog box without initiating a FLA calculation.

Configuring Global FLA

A global configuration for FLA is available by selecting **DMS Settings** and then **FLA Mode** from the Web Workspace **Tools** menu. See **DMS Settings** on page 2-7 for details.

Configuring Individual Feeders for FLA

FLA Mode (**Disabled**, **Sustained**, or **Momentary and Sustained**) can be set for individual feeders in the Configuration Assistant's Feeder Management tab. See **Using the Feeder Management Tab** on page 24-32 for details.

Global FLA Versus Individual Feeder FLA Configuration

The final configuration of FLA on a feeder is the least permissive possible. The following tables show the behavior of FLA for momentary and sustained outages based on the FLA mode.

For Momentary Outages

Global	Feeder	Result
Disabled	Disabled	FLA does not run
Disabled	Sustained	FLA does not run
Disabled	Momentary and Sustained	FLA does not run
Sustained	Disabled	FLA does not run
Sustained	Sustained	FLA does not run
Sustained	Momentary and Sustained	FLA does not run
Momentary and Sustained	Disabled	FLA does not run
Momentary and Sustained	Sustained	FLA does not run
Momentary and Sustained	Momentary and Sustained	FLA runs and shows all DMS Statuses with (M).

For Sustained Outages

Global	Feeder	Result
Disabled	Disabled	FLA does not run
Disabled	Sustained	FLA does not run
Disabled	Momentary and Sustained	FLA does not run
Sustained	Disabled	FLA does not run
Sustained	Sustained	FLA runs and shows all DMS Statuses with (S)
Sustained	Momentary and Sustained	FLA runs and shows all DMS Statuses with (S)
Momentary and Sustained	Disabled	FLA does not run
Momentary and Sustained	Sustained	FLA runs and shows all DMS Statuses with (S)
Momentary and Sustained	Momentary and Sustained	FLA runs and shows initial DMS Status with (M) and final ones with (S)

Chapter 20

Active Network Management Schemes

Oracle Utilities Network Management System Active Network Management Schemes (ANMS) helps you create switching schemes that will execute SCADA commands automatically when certain conditions are met. These conditions, referred to as ANMS conditions, are SCADA points equaling or exceeding configured values.

This chapter includes the following topics:

- Introduction
- Understanding ANMS Schemes

Introduction

ANMS commands are steps in an ANMS switching sheet. Each ANMS switching sheet template allows you to create ANMS schemes using the **ANMS Conditions** tab to add ANMS trigger conditions.

When configured conditions are met by SCADA data, the system will create a new event in the Work Agenda and a new ANMS switching sheet will be created based on the template. The event refers to the activity, and the sheet contains steps and conditions copied from the template.

Execution of ANMS switching sheet steps can be done in **Automatic** or **Manual** modes.

Understanding ANMS Schemes

- Overview of ANMS Scheme Creation
- Understanding ANMS Modes
- Creating ANMS Switching Sheet Templates
- Understanding ANMS Events

Overview of ANMS Scheme Creation

ANMS schemes are created from an ANMS switching sheet template. While very similar to planned switching sheet, the ANMS sheet type provides an **ANMS Conditions** tab where you can set trigger conditions for a selected SCADA device.

The steps to create an ANMS scheme are as follows.

1. Click the **new switching sheet** button ( ) on the Web Workspace toolbar.
2. In the New Switching Sheet dialog box, select the **ANMS Template** row.
3. Click **Create**.
4. In the new ANMS Template sheet, select the **ANMS Conditions** tab and enter the triggers that will create an ANMS event. See **Entering Conditions in the ANMS Conditions Tab** on page 20-3 for details.
5. Add switching steps to the **Steps** tab.
6. Select the **Request** tab and choose the sheet specific **ANMS Mode**. By default it will be in the **Disabled** mode. Select the mode (**Manual** or **Automatic**) to process the scheme. See **Understanding ANMS Modes** on page 20-2 for details.

   Note: The Global ANMS Mode is displayed in the Web Workspace Status bar. Administrators may change the global ANMS Mode by selecting the Web Workspace **Tools** menu, and then selecting the ANMS Mode from the **DMS Settings** menu (see **DMS Settings** on page 2-7 for details).

Understanding ANMS Modes

ANMS Modes control the processing and execution of ANMS schemes. Schemes may be disabled or executed automatically or manually by configuring these modes. ANMS has two types of modes.

Global ANMS Mode

The Global ANMS Mode controls the processing and execution of all schemes in the system. The mode can be in any one of the following states.

- **Disabled:** No processing of schemes will happen.
- **Manual:** Schemes will be processed. When scheme conditions are met by the system, an event will be created in the Work Agenda and an ANMS switching sheet will be created from the template. You will need to execute the sheet and complete the event.

- **Automatic:** Schemes will be processed. When scheme conditions are met by the system, an event will be created in the Work Agenda and an ANMS switching sheet will be created from the template. The steps in the sheet will be automatically executed.

  Note: To set the ANMS Mode, select **ANMS Mode** from the Web Workspace **Tools** menu, and then select the desired mode (**Disable**, **Manual**, or **Automatic**). Only Administrators are allowed to change this mode.

ANMS Template Specific Mode

The mode controls the processing and execution of the sheet based on the original template. The mode is sheet specific and can be in any of the following states.

- **Disabled:** No processing of scheme will happen.
- **Manual:** The scheme will be processed. When scheme conditions are met by the system, then an event will be created in the Work Agenda and an ANMS switching sheet will be created from the template. You must execute the sheet and complete the event.
- **Automatic:** The scheme will be processed automatically when scheme conditions are met by the system. An event will be created in the Work Agenda and an ANMS switching sheet will be created from the template. The steps in the sheet will be automatically executed.

Note: ANMS Template processing will happen only when a previously created sheet (if any) and event (if any) from this template are completed or canceled successfully.

Creating ANMS Switching Sheet Templates

ANMS Switching templates look like standard switching sheet templates with the addition of an **ANMS Conditions** tab that allows you to add conditions to an ANMS scheme and also set the scheme's ANMS mode.

Entering Conditions in the ANMS Conditions Tab

The **ANMS Conditions** tab allows you to add or delete conditions in the ANMS switching sheet template. It contains the following sections:

- **Condition Addition Form**

The **Condition Addition Form** allows you to select SCADA devices and their threshold values that combine to trigger an event. To add the condition to the sheet, do the following.

1. Add device information to the **Device** field using one of these methods:
   - Select the device in the Viewer and click the **Link Device** button ( ).
   - Enter a partial device alias and click the **Device Lookup** button ( ) to open the Select SCADA Device dialog box. Select the device and click **OK**.

2. Select the SCADA device's trigger attribute from the **Attribute** drop-down list, which will be populated with the potential trigger attributes for the device. The selection may include analog and digital attributes.
3. Select the logical operator from the **Operator** drop-down list. This will be populated with following options depending on the type of attribute selected.
    - **Digitals:** Equals
    - **Analogs:** Equals, Greater than, Less than, Greater than or equals, Less than or equals
4. Enter the threshold value in the **Value** field. This varies based on the attribute type.
    - For digitals, you may select from a drop-down list with valid options. For example, for a device status, the drop-down list will allow you to select either **Open** or **Closed**.
    - For analogs, you may enter the value manually in the text box.
5. Click the **Add** button ( ) to enter the condition in the Conditions table.
6. Repeat the steps 1 through 5 to define additional trigger conditions.

    Note: The **Condition Addition Form** is available in the ANMS template, but not on the ANMS sheet.

- **ANMS Conditions Table**

The **Conditions** table contains the conditions added to the sheet. It provides the following columns.

- **Condition #:** The index number for the conditions added to the sheet.
- **Device:** The device alias.
- **Attribute:** The device's selected trigger attribute.
- **Operator:** The selected logical operator value.
- **Value:** The trigger value for the condition.

The table toolbar provides two options for selected rows.

- **Delete** ( ): Allows you to delete selected condition rows.
- **Focus** ( ): Focuses the Viewer on the selected row's condition device.

These options are available in context menus when you right-click a condition row.

Note: The **Delete** button is available in the ANMS template and not on the ANMS sheet.

Selecting the Template's ANMS Mode

The **ANMS Mode** drop-down list, available in the sheet template **Request** tab, allows you to select the operation mode for the scheme. The options are **Disabled**, **Manual**, and **Automatic**; the default value is **Disabled**. You may change the mode to **Automatic** or **Manual** after you have completed adding steps and conditions to the sheet.

The mode is included in the sheet title, which will be constructed as follows.

```
ANMS Template <Sheet ID> (<ANMS Sheet mode>)
```

Deleting an ANMS Template

You can delete an ANMS template by opening it, selecting the **Tracking/Audit Log** tab, and clicking the 'Delete button'.

Understanding ANMS Events

The system processes ANMS schemes in regular cycles. When a scheme's conditions are met, the system will create an ANMS sheet from the template and create an ANMS event. The ANMS sheet's conditions cannot be deleted nor modified, but you may add, delete, and modify steps.

> **Note:** The audit log shows the source ANMS template id from which it has been created.

Understanding ANMS Event Statuses

ANMS events refer to ANMS activities. Each event will be associated with an ANMS sheet. For these events, the status column in the Work Agenda shows one of the following values.

- **A-NEW:** New unacknowledged ANMS event.
- **A-CMP:** ANMS event has been completed.
- **A-CNL:** ANMS event has been canceled by the system.

Understanding ANMS Event Status Transitions

During the course of processing of these events, the following ANMS event status transitions happens in the system.

- **A-NEW to A-CMP:** This transition happens when all the steps in an ANMS sheet have been executed successfully and while completing the sheet.
- **A-NEW to A-CNL:** This transition happens in the manual mode of ANMS processing. The system will cancel the sheet and event if there are changes to the template after the creation of an event and sheet from it.

  Note: The Work Agenda DMS Status column provides information about ANMS events. When row or cell coloring is enabled (see **Understanding the Table Settings Menu** on page 2-9 and **Understanding Conditional Formatting** on page 2-18), the DMS Status information is color coded.

Possible ANMS Events Statuses

1. **ANMS Conditions Matched:** Event shows this value when a template conditions are matched and an event has been created for it.
2. **ANMS Automatically Executing:** The switching steps in the ANMS sheet are automatically executing.
3. **ANMS Automatically Executed:** The switching steps in the ANMS sheet are automatically executed.
4. **ANMS Automatic Execution Failed:** The switching steps in the ANMS sheet failed to execute automatically.

Chapter 21

Model Management

This chapter describes how to manage changes to your system data model.

> **Note**: For complete information about configuring, validating, and testing the data model, see the **Building the System Data Model** section in the *Oracle Utilities Network Management System Configuration Guide*.

This chapter includes the following topics:

- Overview
- Using the Model Management Window
- Model Management Actions

Overview

Model Management is a tool for managing changes to your system model. The process of extracting updates from the GIS and updating the model is unique for each company. Typically, model updates are handled by a set of scripts that run automatically on a regular schedule. If there are problems in the update process, the model administrator can use the Model Management tool to identify and resolve the problems and then re-apply the model updates.

The following describes the model update process and introduces several terms that are used in this chapter:

- **GIS Data Extraction** is the customer-specific process by which data is extracted from the GIS to Oracle's vendor-neutral model preprocessor (`*.mp`) file format.
- `*.mp` files must be **preprocessed** before they can be built into the model. Preprocessing converts the `*.mp` files into the `*.mb` file format required by the Model Builder.
- A set of transactions (`*.mb` files), collectively referred to as a **patch**, are submitted to the Model Builder for processing. Patches are applied to or built into the core operations model.
- The **Model Builder (MBService)** processes the `*.mb` files, saves the information to the Oracle Utilities Network Management System Operations

Model RDBMS, and writes out a set of **maps,** which are used by the Viewer to display portions of the system model.

- If any problems arise during preprocessing or model building, you can use the Model Management tool to perform the following tasks:
  - Identify maps that need to be built (referred to as pending maps)
  - View a list of recent patches and their statuses
  - Display all patches that were applied to a particular map
  - Rebuild individual maps or run a full model build
  - Run the post process script
  - View the Preprocessor Log, the Patch Build Log, and the Patch Build Report
  - Enable or disable model build reporting
  - Delete an import file to be rebuilt.

Using the Model Management Window

The Model Management window displays the following information:

- Menu and Toolbar Options
- Pending Map Section
- Patches Section
- Menu and Toolbar Options
- Status Bar

Model Management actions include:

- Displaying Map History
- Displaying the Preprocessor Log
- Building Maps
- Rebuilding a Patch
- Displaying the Patch Build Log
- Displaying the Patch Build Report
- Enabling and Disabling Model Building

Menu and Toolbar Options

The Model Management menu and toolbar provide access to commonly used functions. Most of the functions in the Actions menu are also available on the toolbar.

File Menu

Menu Option	Description	Toolbar Icon
Print...	Opens the Print Preview dialog box, which allows you to print the contents of the Model Management window.	

Actions Menu

Menu Option	Description	Toolbar Icon
Refresh	Refreshes both the Pending Maps and Patches lists.	
Halt Model Build	Stops all model build activity. See **Enabling and Disabling Model Building** on page 21-8 for more information.	
Enable Model Build	Enables model building activity that was previously halted.	
Run Full Model Build	Rebuilds the entire system model, not just individual maps.	--
Run Post Process	Runs the post-processing script. Post processing takes place after maps are built. The default post-processing script performs a recompute and recache of the control zones in DDService, but this can be modified to perform various tasks, such as generating control zones or computing EE details from the model.	
Enable Model Build Reporting	Enables or disables model build reporting. The Model Build Report lists all objects that were modified when a particular patch was applied. If enabled, a checkmark appears next to the menu option.	--
Build Map	Prompts you to enter one or more map names and then rebuilds the specified maps. If you are entering multiple map names, separate names with spaces, as shown below: `Landbase_49132336 Primary_49132336`	

User Menu

The **User** menu provides options to set preferences and log out of Model Management.

Preferences Menu

Menu Option	Description
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Change Color Scheme...	Opens the Change Color Scheme dialog box, which allows you to select from different user interface coloring schemes. The options are a **Light** scheme, a **Dark** scheme, and the default **High Definition** scheme. Unlike other user preferences, these apply to all environments for the user on the machine.

Help Menu

Menu Option	Description
Model Management Help	Launches the online help system and loads the Model Management content.
Email Log Files...	Gathers the environment's log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within your current environment. This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Model Management	Opens a window with environment and software information.

Pending Map Section

The **Pending Maps** section lists all maps that need to be built. This section displays the following columns:

- **Order:** Displays the order that the maps will be built. The value is returned by the `[project]-maps-to-build` script.
- **Map Name:** Displays the name of the model map.
- **Pending Actions:** Displays one of the following:
  - **To be preprocessed:** The `*.mp` files have not been preprocessed into `*.mb` files, which is necessary before they can be built into the model.
  - **To be committed:** The `*.mp` were preprocessed into `*.mb` files, but have not been committed (built into the model).
- The **Last Build Status** displays the status of the last attempt to build the map. Statuses are:
  - **New:** No attempt has yet been made to complete the pending action.
  - **Failed submit:** The patch was submitted to the Model Builder but the map could not be built. See **Rebuilding a Patch** on page 21-8 for details on correcting this problem.
  - **Failed commit:** The patch was submitted to the Model Builder but the map could not be committed due to a dynamic data error. See **Rebuilding a Patch** on page 21-8 for details on correcting this problem
  - **In progress:** The pending action is currently in progress.

Pending Map Actions

With a map selected in the Pending Maps section, right-click to view the context menu. The options, listed below, are dependent on the state of the file selected.

- **Map History...:** See **Displaying Map History** on page 21-7 for information.
- **Preprocessor Log...:** See **Displaying the Preprocessor Log** on page 21-7 for information.
- **Delete...:** Allows you to delete processed .mb or .mbd files and to be preprocessed *.mp files that you do not want to build or commit to the model.
- **Build Maps:** See **Building Maps** on page 21-7 for information.

Patches Section

The **Patches** section lists all patches for the last 24 hours. To see patches for another time period, change the beginning and ending dates above the list as desired, then click the **Refresh** button.

The Patches section displays the following columns:

- **Patch:** Displays the patch number. The system assigns a number to a patch when it is submitted.
- **Map Names:** Displays the name of the model maps.
- **Creation Date:** Displays the date the patch was created.
- **Commit Date:** Displays the date the patch was submitted to the Model Builder.
- **Build Status:** Displays the status of the patch submission. Statuses are:
  - **Successful:** The patch was successfully applied and the model was updated.
  - **Failed Submit:** The patch was submitted to the Model Builder, but the map could not be built. See **Rebuilding a Patch** on page 21-8 for details on correcting this problem.
  - **Failed commit**: The patch was submitted to the Model Builder, but the map could not be committed due to a dynamic data error. See **Rebuilding a Patch** on page 21-8 for details on correcting this problem.
  - **In Progress:** The patch is currently being processed by the Model Builder. The map files are either being parsed, being applied, or being committed to the database.

Status Bar

The status bar displays the following information:

- **Maps to Build:** The total number of maps that need to be built. These maps are displayed in the Pending Maps section of the screen.
- **Failed Map:** The total number of maps that could not be built (were submitted and failed).
- **Model Build Status**:
  - **Enabled:** Model building is currently enabled. To disable, click the **Halt Model Build** button ( ).
  - **Halted:** Model building has been halted. To re-enable, click the **Enable Model Build** button ( ).
  - **In Progress:** A model build is currently in progress.

Model Management Actions

You can perform the following actions from the Model Management window:

- Displaying Map History
- Displaying the Preprocessor Log
- Building Maps
- Rebuilding a Patch
- Displaying the Patch Build Log
- Displaying the Patch Build Report
- Enabling and Disabling Model Building

Displaying Map History

To view a list of all patches that affect a particular map, follow these steps:

1. Select a map from the Pending Maps list on the Model Management window.
2. Right-click and select **Map History** from the context menu. The Map History dialog box opens. The columns on this dialog box match the columns in the Patches list on the Model Management window.
3. Filter the list as desired by typing the target text in the filter boxes at the top of each column.
4. To take action on an item in the list, right-click the item and then select one of the following options from the context menu:
    - **Rebuild Patch**
    - **Patch Build Log**
    - **Patch Build Report**

Displaying the Preprocessor Log

The preprocessor log displays information and warnings generated during preprocessing. Follow these steps to display the preprocessor log file associated with a map:

1. Select a map from the Pending Maps list on the Model Management window.
2. Right-click and select **Preprocessor Log** from the context menu. The preprocessor log opens.

Building Maps

To build one or more pending maps, follow these steps:

1. Select the map you want to build from the Pending Maps list on the Model Management window.
2. Right-click and select **Build Maps** from the context menu. The system builds the selected map and displays the results in the Result dialog box.
3. Review the results and then click **Close**.

4. Click the **Refresh** button on the toolbar. If the build was successful, the map is removed from the Pending Maps list and a new row is displayed in the Patches list for this map.

Rebuilding a Patch

To rebuild a patch, follow these steps:

1. Select a patch from the Patches list on the Model Management window.
2. Right-click and select **Rebuild Patch** from the context menu. The results of the rebuild process are displayed in the Results dialog box.
3. Review the results, and then click **Close**.
4. Click the **Refresh** button on the toolbar. A new row is displayed in the Patches list for this patch.

Displaying the Patch Build Log

The Patch Build Log displays information and warnings generated during the build process. To display the log for a specific a patch build, follow these steps:

1. Select a patch from the Patches list on the Model Management window.
2. Right-click and select **Patch Build Log...** from the context menu. The log entries are displayed in the Patch Build Log dialog box.
3. Click **Close** to exit.

Displaying the Patch Build Report

The Patch Build Report contains a list of all objects that were modified when a particular patch was built.

> **Note**: The Patch Build Report is only generated if Model Build Reporting is enabled at the time the patch was built. Use the **Enable Model Build Reporting** option on the Actions menu to enable or disable Model Build Reporting.

To display the build report associated with a patch, follow these steps:

1. Select a patch from the Patches list on the Model Management window.
2. Right-click and select **Patch Build Report...** from the context menu. The Patch Build Report dialog box is displayed.
3. Review the report, and then click **Close**.

Enabling and Disabling Model Building

You can temporarily suspend all model building activity if needed. This is useful if, for example, a major storm causes widespread outages. By halting model builds, you can lighten the load on the system while it manages the outages. When storm damage has been repaired, you can resume model building.

To stop model building, select **Halt Model Build** from the **Actions** menu or click the **Halt Model Build** button ( ).

To resume model building, select **Enable Model Build** from the **Actions** menu or click the **Enable Model Build** button ( ).

Chapter 22

Topology Validation Viewer

The Topology Validation Viewer displays reports of a number of different common problem areas with a data model, such as de-energized supply points, loops, and faulted areas.

This chapter includes the following topics:

- Topology Validation Viewer Window
- Running a Topology Validation Report

Topology Validation Viewer Window

The Topology Validation Viewer displays reports in separate tabs and has a dynamic status bar that changes to show the time a particular report was run and the total number of instances found.

The status bar also includes a combo box where you can choose whether the tool displays reports run for the current model or for the nominal model. As you change that selection, the tool repopulates with reports that match your selection.

Menus and Toolbar Options

File Menu

The following table describes the **File** menu options.

Option	Description	Toolbar Icon
Export Table...	Opens a dialog box that allows you to save the current table view data to a comma separated value (csv) file.	
Print…	Opens the Print dialog box, which allows you to print the currently selected report.	
Exit	Closes the Topology Validation Viewer window.	

Action Menu

The following table describes the **Action** menu options.

Option	Description	Toolbar Icon
Run Validation...	Opens the Run Validation dialog box, which allows you to choose the reports to run and select criteria for them.	
View...	Focuses the Viewer on the selected device.	
Refresh	Reloads all reports.	

Help Menu

The following table describes the **Help** menu options.

Option	Description
Topology Validation Viewer Help	Opens the Oracle Utilities Network Management System's online help content for the Topology Validation Viewer.

Running a Topology Validation Report

To run new reports, do the following:

1. Click the **Run Validation...** button ( ) to display the **Run Validation** dialog box.
2. Choose the options you wish to use for your report:
   a. **Model**:
      - **Nominal:** Run the report against the nominal model.
      - **Current:** Run the report against the current model.
   b. **De-Energization Objects**:
      - **All:** Show all de-energized branches
      - **Conductors:** Show only de-energized conductors.
      - **Transformers:** Show only de-energized transformers.
3. In **Run Reports**, select the reports to run:
   - **De-Energization:** Show all de-energized objects excluding supply_nodes.
   - **De-Energized Supply Nodes:** Show de-energized supply_nodes.
   - **Loops/Parallels:** Show loop/parallel objects.
   - **Cross Phase:** Show cross-phase objects.
   - **Mesh ID Groups:** Show Mesh ID groups of more than 3 MIDs.
   - **Feeder ID Groups:** Show Feeder ID groups of more than 2 FIDs.
   - **ATO Groups:** Show all ATOs below an FID.

- **Islands:** Show the size of all islands.
- **Faults:** Show all faulted objects.
- **Partially Closed:** Show all partially closed objects.
- **Model Statistics:** Show all model statistics.
- **Wormholes:** Show potential wormholes in the model, as identified by connected objects with different parent zones. This displays nodes with suspicious connections, as well as the object on each side, and the ncg and feeder name for each. Distance is the shortest distance in NMS coordinates between the two objects. A distance of -1 means that at least one of the connected objects has no representation in the geographic coordinate system.

Click **Refresh** ( ) to load the new reports as they finish.

Chapter 23

Dynamic Protection Schemes

This chapter describes the Oracle Utilities Network Management System Dynamic Protection Scheme functionality.

This chapter includes the following topics:

- Overview
- Configuring Dynamic Protection Schemes
- Global and Feeder Settings
- Viewing and Updating the Protection Scheme for a Device
- Understanding Protection Scheme Events in the Work Agenda
- Periodic Protection Scheme Analysis
- User Initiated Protection Scheme Analysis
- Protection Schemes and Network Topology changes
- Protection Schemes and FLISR
- Protection Schemes and Suggested Switching
- Protection Scheme Conditions

Overview

A *protection scheme* defines the phase and ground protection limits associated with a protection device. Depending on which source is feeding the protection device, NMS can check that the source matches the protection scheme and, if it does not, then NMS will generate an event to switch the protection scheme for the device. Protection scheme events can be configured to be executed manually or automatically.

FLISR and **Suggested Switching** check if protection devices need to have their settings groups changed and take appropriate actions as part of the generated switching plans.

Configuring Dynamic Protection Schemes

Understanding the Switch Protection Scheme Table

Protection schemes are configured in the PF_SWITCH_PROTECTION_SCHEME database table. This table allows an operator to configure a protection scheme that consists of a collection of source, their associated ground and phase protection limits, and the SCADA digital relay used to update the protection settings of the device in the field.

A protection device can be associated with a scheme through the PROTECTION_SCHEME column in the PF_SWITCHES database table.

Understanding SCADA Measurements in Protection Schemes

Several SCADA measurements are used on the protection device to allow the NMS system to change the protection scheme of the device.

- Protection Scheme Enabled
  - This SCADA measurement defines whether dynamic protection schemes are enabled or disabled for the protection device. A value of **Disabled** (0) means NMS will not update the protection limits for the device. A value of **Enabled** (1) indicates that NMS will update the devices protection limits when the source feeding the device changes.

  Note: The measurement name is configured by the **Protection Scheme Enabled** configuration rule in the Configuration Assistant; see **Using the Event Management Rules Tab** on page 24-16 for information on setting rules (Administration users only).
- Protection Scheme Relay 1 to Protection Scheme Relay 8
  - These SCADA measurements represent each of the eight digital relays used to control the protection scheme in the field. When NMS changes the protection scheme for a switch, a control is sent to the relevant digital relay to turn it on.
  - The name of the digital measurements are configured by the **Protection Scheme Relay 1** through to **Protection Scheme Relay 8** rules in the Configuration Assistant, **Event Management Rules** tab. See **Using the Event Management Rules Tab** on page 24-16 for information about configuring rules.

Configuration Assistant, Event Management Rules

The Configuration Assistant, Event Management Rules contains several rules for configuring Protection Schemes in the NMS.

Rule Name	Description
Protection Scheme Enabled	Specifies the SCADA attribute name used to determine if dynamic protection schemes are enabled for a device or not.
Protection Scheme Relay 1	Specifies the SCADA attribute name used to identify the protection scheme digital relay 1.
Protection Scheme Relay 2	Specifies the SCADA attribute name used to identify the protection scheme digital relay 2.
Protection Scheme Relay 3	Specifies the SCADA attribute name used to identify the protection scheme digital relay 3.
Protection Scheme Relay 4	Specifies the SCADA attribute name used to identify the protection scheme digital relay 4.
Protection Scheme Relay 5	Specifies the SCADA attribute name used to identify the protection scheme digital relay 5.
Protection Scheme Relay 6	Specifies the SCADA attribute name used to identify the protection scheme digital relay 6.
Protection Scheme Relay 7	Specifies the SCADA attribute name used to identify the protection scheme digital relay 7.
Protection Scheme Relay 8	Specifies the SCADA attribute name used to identify the protection scheme digital relay 8.
Protection Scheme Period	Specifies the period in minutes in which a background protection scheme analysis will be performed.
Protection Scheme Mode	A flag that indicates the dynamic Protection Schemes global status at system start up.
Protection Scheme Template Base	A template rule that defines the block control action key Protection Schemes uses to create switch plans.
Protection Scheme Template Disable	A template rule that defines the control action key Protection Schemes use to add Disable Protection Scheme Condition steps to a switching plan.
Protection Scheme Template Enable	A template rule that defines the control action key Protection Schemes use to add Enable Protection Scheme Condition steps to a switching plan.
Protection Scheme Quality Bitmask	Indicates the quality code whose presence on a scada digital relay indicates that the relay is inhibited and should not be used.
Protection Scheme Default Relay	The default digital relay to set to On if the NMS deems the protection scheme should be changed to a relay that has had an inhibit quality code applied to it.

Rule Name	Description
Protection Scheme relay 1 action template	A template rule that defines the control action key that should be used to set digital relay 1 to **On**.
Protection Scheme relay 2 action template	A template rule that defines the control action key that should be used to set digital relay 2 to **On**.
Protection Scheme relay 3 action template	A template rule that defines the control action key that should be used to set digital relay 3 to **On**.
Protection Scheme relay 4 action template	A template rule that defines the control action key that should be used to set digital relay 4 to **On**.
Protection Scheme relay 5 action template	A template rule that defines the control action key that should be used to set digital relay 5 to **On**.
Protection Scheme relay 6 action template	A template rule that defines the control action key that should be used to set digital relay 6 to **On**.
Protection Scheme relay 7 action template	A template rule that defines the control action key that should be used to set digital relay 7 to **On**.
Protection Scheme relay 8 action template	A template rule that defines the control action key that should be used to set digital relay 8 to **On**.

Global and Feeder Settings

Configuration Assistant, Feeder Management

The Configuration Assistant, Feeder Management tool allows the operator to configure the dynamic protection scheme settings on a per feeder basis. Two options exist

- Protection Schemes
  - **Disabled:** The protection limits of a protection device will not be updated while the device is being fed from this feeder.
  - **Manual:** The NMS will generate a protection scheme event and an associated switching plan when protection devices on the feeder need their protection limits updated. The switching plan must be executed manually by the operator.
  - **Automatic:** The NMS will generate a protection scheme event and an associated switching plan when protection devices on the feeder need their protection limits updated. The switching plan is automatically executed by NMS.
- Protection Schemes Mode
  - **Before:** If a FLISR or Suggested Switching action results in the protection limits of a device being changed then the switching step to alter the protection limits will be inserted into the switching plan *before* the restoration switch step that caused the change.
  - **After:** If a FLISR or Suggested Switching action results in the protection limits of a device being changed then the switching step to alter the protection limits will be inserted into the switching plan *after* the restoration switch step that caused the change.

Global DMS Settings

You can set the global state of protection schemes (**Disabled**, **Manual**, or **Automatic**) from the Web Workspace **Tools** menu's **DMS Settings** submenu.

The following table outlines the actions taken by NMS under different global and feeder management settings when a protection devices limits require updating.

Global DMS Setting	Feeder Management Setting	Action taken by NMS
Disabled	Disable	No action.
	Manual	No action.
	Automatic	No action.
Manual	Disable	No action.
	Manual	A manual switching plan will be generated.
	Automatic	A manual switching plan will be generated.
Automatic	Disable	No action.
	Manual	A manual switching plan will be generated.
	Automatic	An automatic switching plan will be generated.

Displaying the Protection Scheme Settings

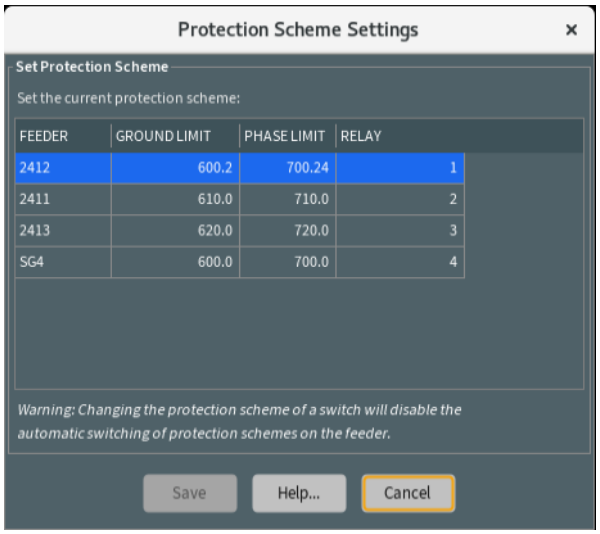
The Protection Scheme and Protection Scheme Mode feeder settings can be viewed in the following NMS tools:

- Feeder Load Summary
- Feeder Load Management Feeder Load Overview tab.
- DMS Summary
- Device Details Balloon, DMS Settings tab.

In addition, the global Protection Scheme setting is displayed in the status bar of the Wen Workspace.

Viewing and Updating the Protection Scheme for a Device

The protection scheme settings for a protection device can been examined using the device's Control Tool from the **Protection Scheme…** options. Selecting these options invokes the Protection Scheme Settings dialog box for the device.



The dialog box shows each of the configured protection settings for the scheme with the current active entry selected and highlighted. Each entry displays the following information:

- **Feeder:** The source feeder feeding the protection device when this entry is active.
- **Ground Limit:** The ground protection limit.
- **Phase Limit:** The phase protection limit.
- **Relay:** The digital relay that will be set to **On** for this row in the protection scheme.

The following buttons are available:

- **Save:** Issue a control to update the protection device to the selected entry. This button is only enabled when an entry other than the current protection setting is selected.
- **Help:** Invoke context sensitive help on the Protection Scheme dialog box.
- **Cancel:** Close the dialog box and do not send an update to the device.

Changing a devices protection scheme setting in the Protection Scheme dialog box will override the NMS systems selection of the best protection scheme setting for that device based on the current topology. To prevent the NMS system from undoing the operators change the Protection Scheme setting is set to **Disabled** for the feeder after the operator initiated control has been sent.

> **Note:** If the operator is logged in as the Trainer user type, then the feeder protection scheme setting will not be disabled.

Understanding Protection Scheme Events in the Work Agenda

When the NMS system update the protection scheme settings for one or more protection devices an event is created in the Work Agenda.

Event Status Codes

The protection scheme events have the following event status codes:

Status Code	Description
T-NEW	A new Protection Scheme event.
T-CNL	The protection scheme event has been canceled.
T-INC	The protection scheme event has been completed but information needs to be entered into the Event Details window.
T-CMP	The protection scheme event has been completed.

DMS Status

The events DMS Status has the following meaning:

DMS Status	Description
Protection Scheme Generated	The protection scheme event and associated switching plan have been generated.
Protection Scheme Automatically Executing	The protection scheme switching plan is currently being executed automatically by the NMS.
Protection Scheme Automatically Executed	The NMS has completed executing the protection scheme switching plan.
Protection Scheme Automatic Execution Failed	The NMS system failed to execute the protection scheme switching plan.
Protection Scheme Manually Aborted	The protection scheme switching plan was aborted.
Protection Scheme Integrity Check Generated	The protection scheme event and associated switching plan have been generated as a result of a background integrity check.

Switching Plans

When the protection scheme event is created and associated switching plan is also created containing the steps required to change the protection scheme settings for the relevant protection devices on the feeder. The switching plan can be viewed from the Event Details via the Actions, Switching menu option.

The steps within the protection scheme switching plan are run in separate groups so that the control can be sent in parallel.

The protection scheme event is configured to be automatically completed when the associated switching plan is complete. When the NMS system is configured to automatically update protection scheme settings, the event will appear briefly in the Work Agenda and then be automatically completed once the final protection scheme is updated.

Closing Previous Protection Scheme Events

When a protection scheme event is generated as a result of a background integrity check then any previous protection scheme events (whether generated as a result of a previous integrity check or as a result of a topology change) will be automatically closed by the system if they are still active and not currently in progress.

Understanding the Number of Retries for a Timed Out Step

If no response (related to a switching action) from SCADA is received within the configured timeout period, then the switch step status will be set to a value of *Failed*. When the Protection Scheme plan is executed in automatic mode or when the plan is manually executed using the **Execute the entire plan** toolbar option, the plan execution can retry a timed out step for a configurable number of times before it sets the switch step status to *Failed*.

Configuring the Number of Retries for a Timed Out Step (Administration Users)

To allow the plan to retry the actions when they time out, configure the rule **DMS Switching Step Fail Retries and Wait Time** in the Configuration Assistant **Event Management Rules** tab's **DMS Application Rules** tree.

> **Note:** The rule may be searched for or you may expand **DMS Application Rules** and then **SCADA Measurement Rules**.

Add an instance of this rule for **Protection Scheme** plans. Configure the following:

- **rule_value_2:** Enter the Protection Scheme sheet class (found in the SWMAN_SHEET_CLS table).
- **rule_value_integer_1:** Enter the maximum number of retries to perform before setting the step as *Failed*.
- **rule_value_integer_2:** Enter the time to wait before retrying the action.

See **Using the Event Management Rules Tab** on page 24-16 for more information on configuring rules.

Periodic Protection Scheme Analysis

The NMS system will periodically perform a background check of all feeders to confirm that each protection device has the correct protection limit settings. Any updates required will be captured in a single event and switching plan and run automatically or manually depending on the global and feeder configuration.

The period between the background checks is controlled by the Protection Scheme Period rule configured in the Configuration Assistant, Event Management tool. The value is in minutes and the default value is 1440 (1 day).

User Initiated Protection Scheme Analysis

In addition to the periodic background check, you may initiate a request to perform a protection scheme background check at any time. This is achieved by selecting **Protection Scheme Analysis…** from the Web Workspace **Tools** menu. In the Protection Scheme Background Check dialog box, select **Start…** to initiate a background check by the NMS system.

Protection Schemes and Network Topology changes

The NMS system will react to changes in the network topology as a result of model builds, switching or unsolicited SCADA events and generate a protection scheme event and switching plan if required.

> **Note:** While a protection device is in a parallel section of network fed by multiple sources then the system shall not update the protection scheme settings of the device.

Protection Schemes and FLISR

During the generation of a FLISR solution the protection settings of the protection devices will be taken into account during the evaluation of each switching step in the FLISR plan. The final switching plan shall include the steps necessary to update the protection scheme settings of any protection device.

The protection scheme steps shall be placed before or after the restoration switches close step in the plan based on the configuration of the feeders Protection Scheme Mode.

Protection Schemes and Suggested Switching

During the generation of a Suggested Switching solution the protection settings of the protection devices will be taken into account during the evaluation of each switching step in the Suggested Switching plan. The final switching plan shall include the steps necessary to update the protection scheme settings of any protection device.

The protection scheme steps shall be placed at the beginning or end of the plan based on the configuration of the feeders Protection Scheme Mode.

Protection Scheme Conditions

The NMS system shall add Disable and Enable Protection Scheme conditions on the feeders associated with the protection devices in the Suggested Switching or FLISR switching plan. The disable condition is added prior to any protection scheme updates or restoration and the condition is removed from the feeder at the end of the plan.

This prevents the NMS system from kicking in and updating the protection settings of the devices as a result of switching or background checks for the duration of the switching plan.

Default Relay

The NMS system configures a default digital relay using the **Protection Scheme Default Relay** configuration rule. This tells the NMS which digital relay to use as the default if one of the relays has been inhibited and the NMS system attempts to set that relay. By default relay 4 is set to the default relay.

For example, a switch is moved to a feeder through switching that requires the protection schemes to be moved to relay 1. Relay 1 is currently inhibited so the system sends a control to set relay 4 on instead. Some time later the inhibit is removed from relay 1 and the NMS sends a control to set relay 1 on.

Chapter 24

Configuration Assistant

Oracle Utilities Network Management System Configuration Assistant provides a graphical view of the Oracle Utilities Network Management System configuration options and allows the user to add, edit, and store configuration changes.

This chapter includes the following topics:

- Getting Started with the Configuration Assistant
- Using the User Administration Tab
- Using the User Permissions Tab
- Using the Flex User Administration Tab
- Using the Mobile User Administration Tab
- Using the Mobile Applications Tab
- Using the Event Management Rules Tab
- Using the Event Details Options Tab
- Using the Schematica Options Tab
- Using the Feeder Management Tab
- Using the State Transitions Tab
- Using the Default Restoration Times Tab
- Using the Limit Configuration Tab
- Using the Alarm Configuration Tab
- Using the Customer Administration Tab

Getting Started with the Configuration Assistant

Understanding Configuration Assistant Menus and Toolbar

This section describes the menu and toolbar options available with the Configuration Assistant.

File Menu.

Menu Option	Description	Toolbar Icon
Export Configuration...	Generates SQL statements for the current state of the configuration associated with every tab on the application. Once generated, the SQL statements are displayed in a window with options to save or print the information.	
Print Preview	Opens the Print Preview dialog box, which allows you to print out the User Administration tab, Event Management Rules tab, Event Details Options tab, and Work Agenda Predefined Filter tab information from the current Configuration Assistant window. See **Taking Authority for Control Zones** on page 2-24 for details on using Print Preview.	

Actions Menu

The **Actions** menu can vary by tab. See the tab descriptions for **Actions** menu option differences.

Menu Option	Description
Create Client Installer...	Launches the client installer application. See the *Oracle Utilities Network Management System Installation Guide* for details on creating the installer and installing local copies of the Oracle Utilities Network Management System client applications. This menu item is available on all tabs.

User Menu

The User menu provides options to set preferences and log out of the Configuration Assistant.

Preferences Menu

The **Preferences** menu allows you to control certain common features of the Web Workspace.

Menu Option	Description
Smaller Font	Decreases the font size in text and icons. Repeat to further decrease the font size.

Menu Option	Description
Bigger Font	Increases the font size in text and icons. Repeat to further increase the font size.
Reset Font	The application will reset the text and icons to use their default font size.
Save Preferences	Saves the current settings as the user's preference. See **Saving and Restoring Workspace Preferences** on page 2-14 for details.
Restore Preferences	Restores the environment preferences to the default settings. See **Restoring to Default Preferences** on page 2-15 for information.
Change Color Scheme...	Opens the Change Color Scheme dialog box, which allows you to select from different user interface coloring schemes. The options are a Light scheme, a Dark scheme, and the default High Definition scheme. Unlike other user preferences, these apply to all environments for the user on the machine.

Help Menu

Menu Option	Description
Configuration Assistant Help	Opens the Configuration Assistant online help file.
Email Log Files...	Gathers the environment's log files and attaches them to a new email message using your default email client. The log files can then be sent to your support team or contact for further analysis.
Set Debug...	Launches the Set Debug dialog box allowing you to set debug on or off within all client environments. As a Configuration Assistant user type, the dialog box also allows you to set debug within the services (JMService, MTService, etc). This is used for debugging and analysis purposes. See **Setting Debug** on page 24-67 for more information.
About Configuration Assistant	Opens a dialog box that displays information regarding what version of the application is presently running, as well as version and other information about the Oracle Utilities Network Management System Web Gateway that the application is using.

Using the User Administration Tab

The Configuration Assistant User Administration tab allows an administrator to add and remove users, modify user types associated with users, and view user login activity. The User Administration tab contains the following panes:

- Understanding the Current Users Pane
- Understanding the User Type Memberships Pane
- Understanding the User Log Pane

From this tab, you can perform the following tasks:

- Adding a User
- Editing a User
- Removing a User
- Saving Exported User Configuration
- Changing User Type Memberships
- Reorder Current User Types
- Resetting a User Login

Understanding the Current Users Pane

The Current Users pane lists all of the users currently configured to use one or more modules of Oracle Utilities Network Management System, and allows you to add, edit, and remove users.

Each time you select a row in the Current Users table, the User Type Memberships and User Log panes populate with information that pertains to the selected user.

The Current Users pane displays the following fields and buttons:

- The **Username** column contains the Oracle Utilities Network Management System login name of the user.
- The **Full Name** column contains the full name of the user.
- The **Last Logon** column contains the date and time the user last logged on.
- The **Last Logoff** column contains the date and time the user was last logged off.
- The **Add** button allows you to create a new user.
- The **Remove** button allows you to remove an existing user.
- The **Edit** button allows you to modify the Username and Full Name of the user.
- The **Refresh** button refreshes the table with the current contents of the database.
- The **Service Recache** button causes the Oracle Utilities Network Management System services to recache with the changes you made in the Configuration Assistant window. If you do not do this, many of your changes may not be recognized until Oracle Utilities Network Management System

services are restarted. For example, you may be able to log in as a new user without recaching, but certain device operations will fail to be recognized and will generate errors.

- The **Export Configuration...** button generates SQL statements for the current state of the configuration associated with the **User Administration** tab. These SQL statements may then be saved to a file and/or printed.

Adding a User

To add a new user to Oracle Utilities Network Management System, complete these steps:

1. Click the **Add** button in the **Current Users** pane. The Add / Edit User Information dialog box appears.
2. Enter the user information in the data fields:
   - **Username:** the new user's system login name.
   - **Full Name:** the user's full name.
   - **Default Zone Set:** optionally, add the name of the control zone set that the user will be automatically subscribed to when they log in to the system.
   - **Excluded Zone Set:** optionally, enter a zone set that the user cannot subscribe to.

   Note: Once you select a zone in either the Default Zone or the Excluded Zone, that zone will be removed as a choice from the other.
3. Select the user's account setting:
   - **Active User**: designates an active user account; required to login to NMS.
   - **Priority User**: used for callback processing, which sends priority customer callback notifications to users with the Priority User account setting selected.
   - **External User**: designates an external system user agent that connects to NMS via an interface, such as Web Callbacks or IVR.

   Note: Temporarily Inactivating a User

   When a user will be inactive for a period of time, you may wish to set their user status to inactive by deselecting the Active User option. This will keep them from logging into the system, but allows for simple reinstatement when they become available.
4. Click the **Save** button. The new user is added to the Current Users table.

   Notes:
   - If the entered **Username** already exists, an error will appear and you will have to modify the username.
   - To cancel without saving changes, click the **Cancel** button.

Editing a User

To edit the name information for an Oracle Utilities Network Management System user, complete these steps:

1. Select the user you wish to edit in the **Current Users** table.
2. Click **Edit**. The Add / Edit User Information dialog box appears.
3. Modify any of the enabled fields, as desired.
4. Click **Save**. The user information is updated in the Current Users table.

   Note: If the modified Username already exists, an error will appear and you will have to modify the username.

Removing a User

To remove a user from Oracle Utilities Network Management System, complete these steps:

1. Select the user you wish to remove in the **Current Users** table.
2. Click **Remove**. A confirmation dialog box appears.
3. Click **Yes** to remove the user or **No** to cancel the removal.

Saving Exported User Configuration

To generate and save SQL statements for the current state of the configuration associated with the User Administration tab, complete the following steps:

1. Click **Export Configuration...** beneath the Current Users table. A dialog box appears indicating that the configuration is being generated.
2. Once the generation is finished, the Generated Configuration dialog box appears.
   - To save the generated SQL statements to a file, click **Save**. The Save Configuration File dialog box appears. Type a name for the file into the **File name** field. The Save Configuration File dialog box disappears.
   - To print the generated SQL statements, click **Print**. The Print Preview dialog box appears.
   - Click **Cancel** to close the Generated Configuration dialog box.

Understanding the User Type Memberships Pane

The **User Type Memberships** pane allows you to assign a selected user to Oracle Utilities Network Management System applications and set their permissions by user type (see also **Understanding User Types** on page 1-2) for each.

The **User Type Membership** pane displays the following fields and buttons:

- The **Products** column lists the Oracle Utilities Network Management System modules.
- The **Remaining User Types** column lists the user types available to be assigned to the selected product.
- The **Current User Types** column lists the user types assigned to the selected product.

Product User Type Matrix

User Type	Configuration Assistant	Flex	Model Management	Service Alert	Storm Management	Web Call Entry	Web Callbacks	Web Workspace
Administration	X			X				X
Crew Operations								X
Full Operations					X		X	X
Full Operations Plus Switching								X
Model Validation			X					
Storm Administration					X			
Switching Request								X
Trainer								
Trouble Maintenance								X
View Only					X			X
Web Call Entry						X		
Flex Crew Operations		X						
Flex Full Operations		X						
Flex Full Operations Plus Switching		X						
Flex Switching Request		X						
Flex View Only		X						

Note: See Appendix E- Tool to User Type Matrix for a list of tools that the user type may access in each module.

- The **Current User Types** column lists the user types for the selected product that the selected user has access to.
- The **Add Selected User Types** button allows you to grant access to a selected user type from the Remaining User Types column to the selected user.
- The **Remove Selected User Types** button allows you to remove access to a selected user type from the Current User Types column from the selected user.

Note: For information on the Flex Operations user types, see **Using the Flex User Administration Tab** on page 24-12.

Changing User Type Memberships

To modify the user type memberships for a user, complete the following steps:

1. Select the user whose memberships you wish to modify in the **Current Users** table. The User Type Memberships table populates with the current user type information.
2. Select the desired product from the **Products** column. The Remaining User Types and Current User Types columns populate with the user type information for that product for the selected user.
    - To add a user type for a selected product, select user types from the **Remaining User Types** column.
        - Click **Add Selected User Types**. The selected user type will move to the Current User Types column
    - To remove a user type for a selected product:
        - Select the user type from the **Current User Types** column. Click **Remove Selected User Types**. The selected user type will move to the Remaining User Types column.

    Note: See the *Oracle Utilities Network Management System Configuration Guide* for details on adding and configuring user types.

Reorder Current User Types

To change the order of the configured user types on the login window, complete the following steps:

1. Select the user whose memberships you wish to modify in the **Current Users** table. The User Type Memberships table populates with the current user type information for the selected user.
2. Select a user type in the **Current User Types** column that you wish to move in the list. The arrows to the right of the column are now sensitized.
3. Click the appropriate arrow to change the user type order:
    - Click the **Move to top** button ( ) to move the selected user type up to the top of the list.
    - Click the **Move up** button ( ) to move the selected user type up one position in the list.

- Click the **Move down** button ( ) to move the selected user type down one position in the list.
- Click the **Move to bottom** ( ) to move the selected user type down to the bottom of the list.

Understanding the User Log Pane

The User Log pane displays the login history for the selected user. From this pane you may also fix log entries for a user that is unable to login because the system thinks the user is already logged in from elsewhere (for example, a system error of some sort prevented the database from being updated with the correct information).

The User Log pane displays the following fields and buttons:

- The **Host** column displays the name of the host machine that the user was logged in from.
- The **Display** column displays the name of the display machine that was being used.
- The **Product** column displays the name of the product the user was logged in to.
- The **User Type** column displays the name of the user type the user was logged in as.
- The **Login Date** displays the date and time of the user login.
- The **Login Status** displays the status of the user login (for example, Successful).
- The **Logout Date** displays the date and time of the user logout.
- The **Logout Status** displays the status of the user logout (for example, Successful).
- **Export Table…:** Opens a dialog box to allow you to save the user log table view data to a comma separated value (csv) file.
- The **Reset Login** button allows you to force a logout entry into the database for a user that is still logged in per the User Log information. This is useful in cases where a user's client may have crashed for some reason and the user's loss of client is not recorded in the database as a logout. The system also unsubscribes the user from any zones to which they were subscribed.

Resetting a User Login

To reset a user login, complete the following steps:

1. Select the user whose login you wish to reset in the **Current Users** table. The User Log table populates with the login history for the selected user.
2. Select the rows in the **User Log** table that pertains to the logins you wish to reset. The **Reset Login** button sensitizes.

   Note: The **Reset Login** button is only available for rows where the Logout Date, Logout Status, and Logout Method columns are blank.
3. Click the **Reset Login** button. The User Log table updates the selected rows with the current date and time for the Logout Date, Forced for the Logout Status, and System for the Logout Method.

Using the User Permissions Tab

The **User Permissions** tab allows you to define what features and tools an OMA and/or Flex user has access to and can be used to customize their user interface.

Understanding the Permissions (FlexOps & OMA) Pane

The **Permissions (FlexOps & OMA)** pane provides a table showing actions that require permission and whether an OMA or Flex user may perform the action.

The table displays the following:

- **Permission:** The action (including tool use) that the user may use if given permission.
- **OMA:** Whether the OMA user has permission (**Yes** or **No**) to perform the action.
- **Flex:** Whether the Flex user has permission (**Yes** or **No**) to perform the action.
- **Description:** A short description of the action.

  Note: There are many permissions defined to allow finer detail in what the user is allowed or not allowed to do.

  - **Change Crew:** This access allows a user to change the crew. If it is not assigned to a user, then the user will be locked to their existing crew.
  - **Extended Switch Step Updates:** Client side rule to allow the user to edit additional switch step fields beyond the completion time and comments fields.
  - **Allow Switch Step Updates:** Allow the user to update switch sheet transitions and update fields.
  - **Allow Device Operations:** Ability to mark non-SCADA devices open or closed.

  Note: Other permissions can be defined that can be accessed by the application. However, using permissions in that manner should not be used for security purposes, because only the above permissions are integrated into the server's permissions.

The buttons below the table allow you to add, remove, and edit permissions. The **Refresh** button will manually update the table with any changes made to the Permissions table.

Adding Permissions

You can add permissions for configured actions that are not in the Permissions table.

> **Note:** You need to know the name of the configured action to be able to initiate the action. See the *Oracle Utilities Network Management System Configuration Guide* for details on configuring actions.

To add a permission do the following:

1. Click the **Add...** button.
2. In the Add/Edit Mobile Permissions dialog box, enter the following:
   - **Name:** The name of the permission that you are adding.
   - **Description:** A description of the permission.
   - **OMA:** Drop-down list allowing you to select whether the OMA user is allowed to perform the action (**Yes**) or not (**No**).
   - **FLEX:** Drop-down list allowing you to select whether the Flex Operations user is allowed to perform the action (**Yes**) or not (**No**).
3. Click **Save Changes** to save the new permission or click **Cancel Edit** to close the dialog box without saving.

Editing Permissions

To edit a permission, do the following:

1. Select the permission row and click the **Edit...** button.
2. In the Add/Edit Mobile Permissions dialog box, edit the fields as needed.
3. Click **Save Changes** to update the permission information or click **Cancel Edit** to close the dialog box without saving.

Removing Permissions

To delete a permission, select the permission row and click the **Remove** button.

Using the Flex User Administration Tab

The **Flex User Administration** tab provides configuration options for Flex users that are similar to those on the **User Administration** tab. The tab provides panes for configuring different permissions.

Understanding User Type Permissions Pane

The **User Types Permissions** pane lists the **Flex Operations User Types**, **Available User Type Permissions**, and **Current User Type Permissions** in a three column layout.

The standard Flex User Types are:

- **Flex Full Operations plus Switching:** Provides access to all Flex Operations tools (such as the Events List, Map, and so on) plus the Switching-related tools, such as switching sheets.
- **Flex Full Operations:** Provides access to all Flex Operations tools.
- **Flex Crew Operations:** Provides a limited version of Flex Operations with only the tools necessary for crew administration functions.
- **Flex Switching Request:** Provides access to the Flex Operations Switching Request environment with only the tools necessary to create switching requests.
- **Flex View Only:** Provides read-only access to the operational environment.

Adding User Types and Assigning Permissions

To add a Flex user type, perform the following actions.

1. Click **Add User Type** to open the Add/Edit User Type dialog box.
2. In the dialog box, enter the **User Type Name**.

   Once you have named a new user type, you will need to assign them permissions for what tasks they are allowed to perform. For example, the user types range from a very restricted View Only user to the Full Operations plus Switching user who has access to view and perform an expansive list of actions.

   Note that when you select a new user type in the **User Type** column, the **Available User Type Permissions** column will display the list of available permissions and the **Current User Type Permissions** column will be empty.
3. Select the new **User Type** and then select a permission from the **Available User Type Permissions** column. Click the **Add Selected Permission** button to give the user type permission to perform the action. The permission will be moved to the **Current User Type Permissions** column.
4. Continue adding the permissions for the user type, as necessary.

   Note: You can remove a User Type by selecting it from the User Type column and clicking the **Remove User Type** button.

Removing Permissions from a User Type

To remove a permission from a Flex user type, select the **User Type**, then select the permission you wish to remove from the **Current User Type Permissions** column, and click the **Remove Selected Permission** button.

Controlling Permissions at a User Level

In addition to the permissions associated with a **User Type**, you can assign or deny users individual permissions using the **User Additional Permissions** and the **User Denied Permissions** panes, respectively. The two panes are analogous to the **User Type Permissions** pane with three columns listing users, available permissions, and permissions granted or denied for a selected user.

- The **User Additional Permissions** pane allows you to specify that a selected user will always have a given permission regardless of what **User Type** they log in as.
  - To grant an additional permission, select the user name from the **User** column, select a permission to be granted for all of the user's assigned user types, and click **Add Selected Permission**.
  - You can remove an additional permission by selecting the user and the permission (in the **Current User Additional Permissions** column) and clicking **Remove Selected Permission**.
- The **User Denied Permissions** pane allows you to specify that a selected user will not be allowed a given permission even if it is included in the **User Type** they log in as.
  - To deny a permission, select the user name from the **User** column, select a permission to be denied (for all of the user's assigned user types), and click **Add Selected Permission**.
  - You can remove a denied permission by selecting the user and the permission (in the **Current User Denied Permissions** column) and clicking **Remove Selected Permission**.

Both panes have a **Refresh Flex Users...** button that allows you to update the table.

Using the Mobile User Administration Tab

The Mobile User Administration tab allows you to configure users and permissions for the Oracle Utilities Operations Mobile Application.

Understanding the Mobile Users Pane

The Mobile Users pane contains a table listing the current user accounts and allows you to add, edit, or remove users.

The table columns are:

- **Username:** The user's username, which is used to log into the application.
- **First Name:** The user's first name.
- **Last Name:** The user's last name.
- **Creation Key:** The key that was used to create the user when they logged in for the first time (as a new user).
- **Company:** The user's associated company.
- **Permission Set:** The permission sets of the user.
- **Crew:** The current crew of the user.
- **Password:** The password of the user.
- **Last Contact:** The date and time the mobile user last contacted NMS. The column is empty if the mobile user has logged out of OMA.

The **Add**, **Remove**, **Edit**, **Refresh**, and **Export Configuration...** buttons operate the same way as in the User Administration tab; see **Using the User Administration Tab** on page 24-4 for details. The **Login History...** button displays the Login History dialog box for the selected mobile user.

Mobile User Type Memberships

The Mobile User Type Memberships pane lists the user types and allows you to assign a user selected in the Mobile Users table to them.

- **Remaining Mobile User Types:** Lists the user types available for the selected mobile user.
- **Current Mobile User Types:** Lists the user types that have been associated with the selected mobile user.

Current Keys

Key: The key that can be given to a crew to create a user account. The key should be sufficiently complex so that it could not be guessed.

Crew Prefix: A required user name prefix for user names created using this key. For example, "OMA_" would require any user name creation request to have this prefix.

Permission Set: The permission set that the created user will be a member of.

Default User Types: A list of user types that will be associated with a user created with this key.

Crew Type: If a crew type is listed, then a crew of that type will be created automatically when this key is used to create a user. If it is left blank, then the user will choose an existing crew from a list when the user logs on.

Available: The number of user accounts that can be created using the key. It is decremented each time it is used.

Permission Sets

This contains the list of permission sets, which is a group of permissions that can be used to define what access a user has to the system.

Changing Permission Sets

To modify the permissions for a permission step, do the following:

1. Select the set you wish to modify.
2. To add a permission, select from the Available Permissions column. Click **Add Selected Permission**. The selected user type will move to the Current Permissions column
3. To remove a permission, select the permission from the Current Permissions Column and click Remove. The selected permission will move to the Available Permissions column.

Using the Mobile Applications Tab

The Mobile Applications tab allows you to generate keys and administer keys that determine whether incoming messages are from an approved application. It also gives you a way of enabling and disabling an application while allowing other applications to continue to work.

See the *Operations Mobile Application Installation and Deployment Guide* for details.

Using the Event Management Rules Tab

The Event Management Rules tab allows an administrator to add, edit, remove, update, and activate Event Management Rules in the Oracle Utilities Network Management System. These rules govern the behavior and output of Web Trouble in various situations, such as outage prediction, crew behavior, momentary outage processing, and so on.

This section contains the following information:

- Event Management Rules Components
- Working with Rules

Event Management Rules Components

The Event Management Rules tabs contains three panes:

- Rule Categories Pane
- Currently Configured Rules Pane
- Documentation Pane

Rule Categories Pane

The Rule Categories pane on the Event Management Rules tab lists all of the Event Management Rules available for configuration, organized by functional category. The search function at the top of the pane allows you to search for rules.

The Rule Categories may be expanded or collapsed using the buttons below the Categories tree:

- **Expand All:** expands all of the rule category folders to display their contents.
- **Collapse All:** collapses all of the rule category folders.

Selecting a Category to View

When you select a category folder from the Rule Categories pane, the folder expands to display the names of the Event Management Rules within that category. Some of the categories may also have sub-categories.

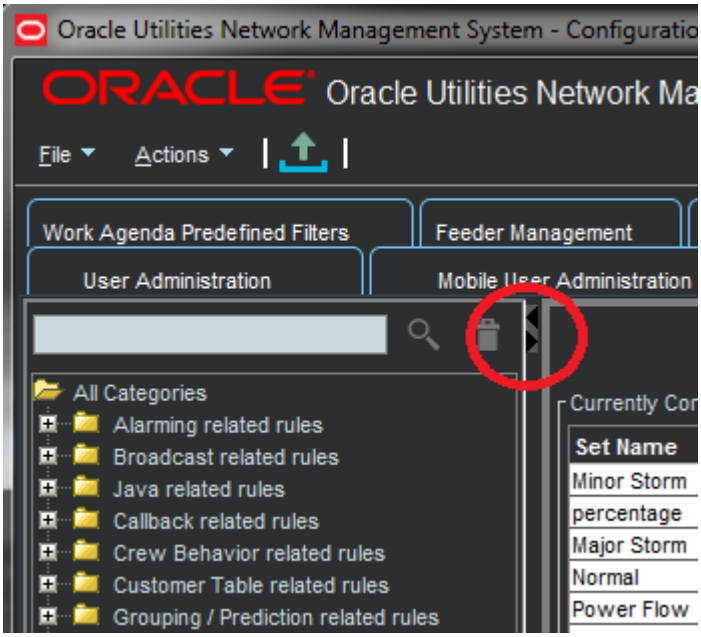
When an individual rule is displayed in the list, a symbol appears to the left of the rule. The bullet ( ) symbol indicates that the rule is already configured in at least one rule set.

The red circle with an X ( ) symbol indicates that the rule is not presently configured in any rule set.

When you select an individual rule (or certain categories) in the list, the Documentation pane on the Event Management Rules tab populates with documentation for the selected rule.

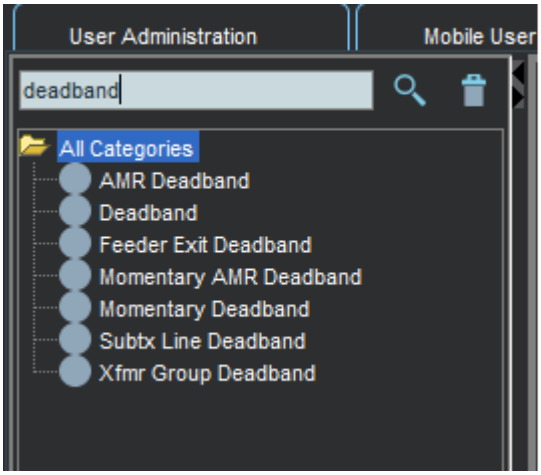
Resizing the Rule Categories Pane

You can resize the Rule Categories pane by dragging the right side of the pane to the left or right. You can also quickly expand or collapse it by clicking the directional arrows next to the upper right corner of the rules categories pane.



Searching for a Rule

You may filter the rules by adding a search term to the search field and clicking the search (🔍) button.



To clear the search, click the trash can button ( ).

Currently Configured Rules Pane

The Currently Configured Rules pane on the Using the Event Management Rules Tab tab lists the SRS rules configured for Oracle Utilities Network Management System. It allows you to add, edit, and remove rules.

> **Note:** The table uses *friendly* names for readability. For example, one SCADA data related rule has a friendly **Rule Name** of **Allow Calculated Points**, but the code rule name is `RT_CALCULATED_POINTS`. See **Documentation Pane** on page 24-19 for more information.

Action Buttons

- The **Add** button allows you to add a rule to the configuration.
- The **Remove** button allows you to remove a selected rule from the configuration.
- The **Edit** button allows you to edit the selected rule in the configuration.
- The **Refresh** button refreshes the table with the current contents of the database.
- The **Service Recache** button causes the Oracle Utilities Network Management System services to recache with the changes you made in the Configuration Assistant window. If you do not do this, your changes will not recognized until Oracle Utilities Network Management System services are restarted.
- The **Export Configuration...** button generates SQL statements for the current state of the configuration associated with the Event Management Rules tab. These SQL statements may then be saved to a file and/or printed.

Currently Configured Rules Table

The Currently Configured Rules pane displays the following fields and buttons:

- The **Set Name** column displays the friendly Set Name that the rule is configured in.
- The **Incident Type** column displays the configured Incident Type value of the rule.
- The **Rule Name** column displays the rule name.
- The **Rule Value 1** column displays the configured Rule Value 1 value of the rule.
- The **Rule Value 2** column displays the configured Rule Value 2 value of the rule.
- The **NCG Class** column displays the configured ncg class value of the rule.
- The **NCG Index** column displays the configured ncg index value of the rule.
- The **Rule Value Integer 1** column displays the configured Rule Value Integer 1 value of the rule.
- The **Rule Value Integer 2** column displays the configured Rule Value Integer 2 value of the rule.
- The **Rule Value Integer 3** column displays the configured Rule Value Integer 3 value of the rule.

- The **Rule Value Integer 4** column displays the configured Rule Value Integer 4 value of the rule.
- The **Rule Value Integer 5** column displays the configured Rule Value Integer 5 value of the rule.

Filtering the Currently Configured Rules Table

To filter the Currently Configured Rules table based upon a selected column value, complete these steps:

1. Click a cell that contains the value you want to filter the table by. The row will be highlighted and the cell that was clicked will have a border indicating that it is selected.
2. Right-click and choose **Toggle Auto Filter** from the context menu to filter the table by the selected column/cell value combination.

   To remove filtering, right-click anywhere in the table and select **Toggle Auto Filter**. The filter will be removed and all table rows will appear.

Documentation Pane

When you select an individual rule and certain categories from the list in the Rule Categories pane, the Documentation pane populates with documentation for the selected rule. For categories, the information is usually descriptive, but the individual rules documentation has the database names for the rule, its attributes, and valid values. If there are related rules, the related rule will be included and will link to the documentation content for that rule.

Example

If you select the **Broadcast related rules** category, the Documentation pane populates with:

> These rules control how calls and events get broadcast, including which calls appear in the viewer.

If you select the **Broadcast Clues** rule, the Documentation pane will update with documentation for broadcastClues (the database name). Part of the broadcastClues description includes a link to the documentation page for the related broadcastIncidents rule, which broadcastClues is normally used with.

The friendly names in the Currently Configured Rules pane correspond to the database names as follows:

Friendly Name	Database Name	Database Description
Set Name	set_name	A name used to identify what set a rule should belong to.
Incident Type	incident_type	See each individual rule description for valid value for this column.
Rule Name	rule_name	The name of the rule.
Rule Value 1	rule_value_1	A character string. See each individual rule description for valid and default values, if applicable.

Friendly Name	Database Name	Database Description
Rule Value 2	rule_value_2	An integer value. See each individual rule description for valid and default values, if applicable.
NCG CLS	ncg_cls	Used in conjunction with the ncg_idx value to narrow the application of a rule to a specific control zone.
NCG Index	ncg_idx	Used in conjunction with the ncg_cls value to narrow the application of a rule to a specific control zone.
Zone	N/A	The name of the control zone as derived from NCG CLS and NCG Index (as queried from the control_zones table).
Rule Value Integer 1	rule_value_integer_1	An integer value. See each individual rule description for valid and default values.
Rule Value Integer 2	rule_value_integer_2	An integer value. See each individual rule description for valid and default values.
Rule Value Integer 3	rule_value_integer_3	An integer value. See each individual rule description for valid and default values.
Rule Value Integer 4	rule_value_integer_4	An integer value. See each individual rule description for valid and default values.
Rule Value Integer 5	rule_value_integer_5	An integer value. See each individual rule description for valid and default values, if applicable.
Active	rule_active	The active state of the rule.

Working with Rules

Add a Rule to the Configuration

To add a rule to the configuration, complete these steps:

1. Click **Add** to open the Event Management Rule Fields dialog box.

   Note: If you had first selected a row in the Currently Configured Rules table, the dialog box will be initialized with the values from that row.

2. Select the name of the rule you wish to add from the **Rule Name** drop-down list.
3. Select the name of the rule set you wish to add the rule to from the **Ruleset** drop-down list.
4. Indicate whether or not you want the rule to be activated in the rule set by checking (or unchecking) the **Active** check box.
5. Enter the desired configuration values for the remainder of the fields.

   Note: See the information in the **Documentation** pane for valid values for the fields.

6. Click **Save** to save the newly added rule.
7. If the newly added rule already exists in the specified rule set, a conformation dialog box appears.
    - Clicking **Yes** overwrites the existing rule configuration with the new configuration.
    - Clicking **No** will not add the new rule and you will be returned to the Event Management Rule Fields dialog box.

    Note: This is the only validation currently performed when adding a rule. Please refer to the individual rule documentation in the **Documentation** pane for further information regarding valid values.

Edit a Rule in the Configuration

To edit a rule in the configuration, complete these steps:

1. Select the rule you wish to edit in the **Currently Configured Rules** table.
2. Click **Edit**. The Event Management Rule Fields dialog box appears.
3. Modify the rule fields as desired.

    Note: See the **Documentation** pane for valid field values.
4. Click **Save**. The rule information is updated in the Currently Configured Rules table.

    Note: If you modify a rule's rule set to have values that already exists in that other rule set, an error dialog box appears. Clicking **Yes** will overwrite the existing rule configuration with the new configuration that you specified. Clicking **No** will preserve the existing rule.

    For example, you select a **Crew Incident Alarm** rule that is in the Major Storm rule set and then select **Minor Storm** from the **Ruleset** options. If the rule already exists in the Minor Storm rule set, you will get the error.

    This is the only validation currently performed when editing a rule. Please refer to the individual rule documentation for further information regarding what the valid values are for a particular rule.

Remove a Rule from the Configuration

To remove a rule from the configuration, complete these steps:

1. Select the rule you wish to remove in the **Currently Configured Rules** table.
2. Click **Remove**. A confirmation dialog box appears.
3. Click **Yes** to remove the rule or **No** to cancel.

Export Configuration

To generate and save SQL statements for the current state of the configuration associated with the Event Management Rules tab, complete the following steps:

1. Click the **Export Configuration...** button beneath the Currently Configured Rules table. A dialog box appears indicating that the configuration is being generated.
2. Once the generation is finished, the Generated Configuration dialog box appears.
    - To save the generated SQL statements to a file, click **Save**. The Save Configuration File dialog box appears. Type a name for the file into the **File name** field. The Save Configuration File dialog box disappears.
    - To print out the generated SQL statements, click **Print**. The Print Preview dialog box appears.
    - Click the **Cancel** button to close the Generated Configuration dialog box.

Using the Event Details Options Tab

The Event Details Options tab allows an administrator to configure the contents of each of the option menus that reside Event Details windows. (See **Understanding Event Details** on page 3-1 for more information.)

This tab contains one pane:

- Event Details Options Pane

Use this tab to perform the following tasks:

- Adding an Options Pane Submenu
- Adding an Option
- Removing an Option
- Editing an Option
- Saving Exported Event Details Configuration
- Reordering Options

Event Details Options Pane

The Event Details Options pane allows you to add, edit, remove, and reorder the contents of each of the option menus that reside on the Event Details windows (see **Understanding Event Details** on page 3-1 for details).

The Event Details Options pane displays the following fields and buttons:

- The **Event Type** allows you specify which event type configuration you want to modify the options of (for example, Outage, Non Outage, Planned Event, Switching Event).
- The **Event Details Option Menus** selection menu contains a list of the option menus that exist for the selected Event Type.
- The **Options for Currently Selected Menu** table populates with the currently configured options for the selected option menu and event types.
- The **Add** button allows you to add a new option or submenu to the selected option menu for the selected event type.
- The **Remove** button allows you to remove the selected option.
- The **Edit** button allows you to edit the selected option.
- The **Refresh** button refreshes the table with the current contents of the database.
- The **Export Configuration...** button generates SQL statements for the current state of the configuration associated with the Event Details Options tab. These SQL statements may then be saved to a file and/or printed.

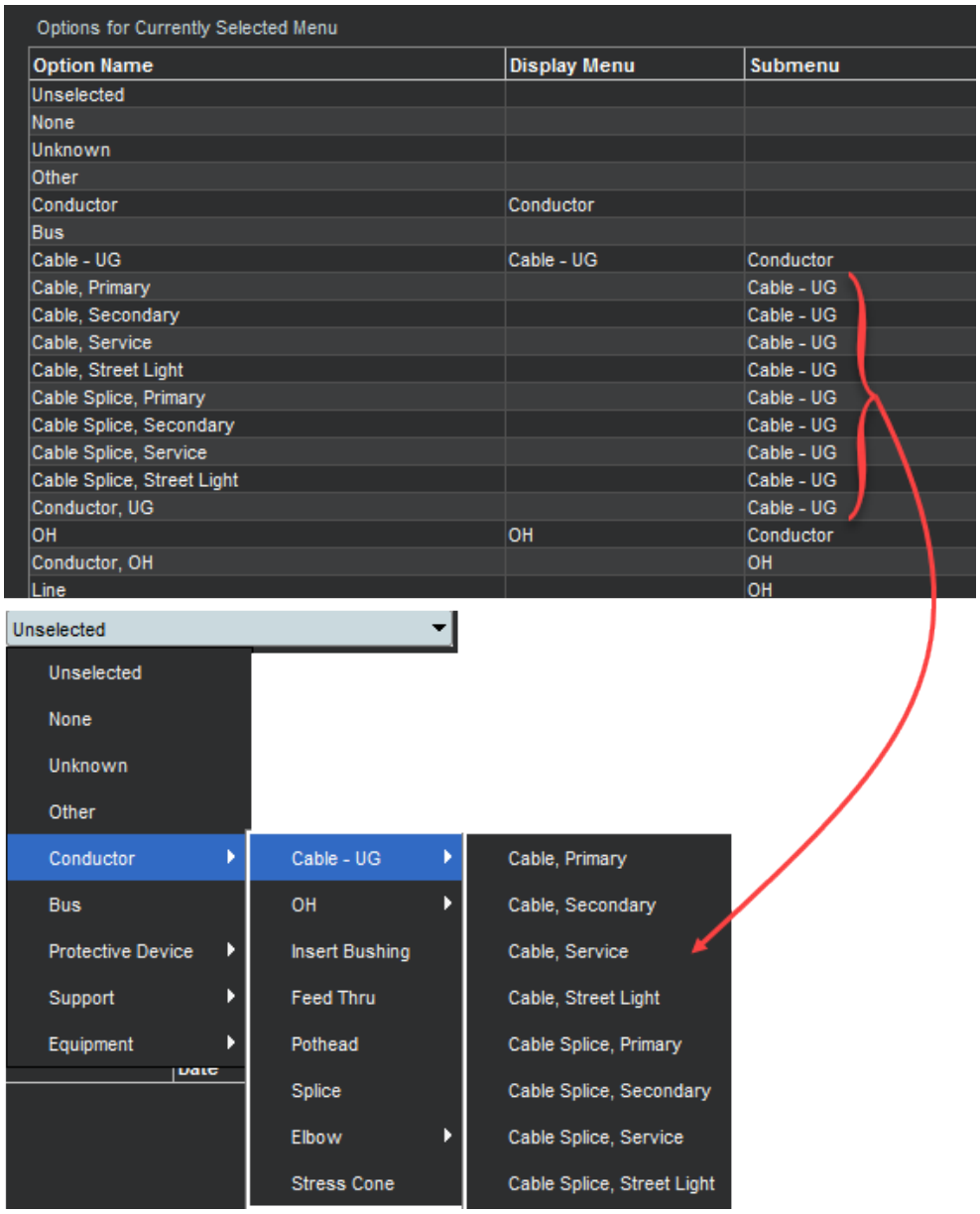
Adding an Options Pane Submenu

Submenus allow you to create cascading groups of Event Details options that provide logical categories for the user to drill down to make their selection. To add a submenu to an option menu, complete the following steps:

1. Select the **Event Type** whose option menu you wish to change.
2. Select the option menu you wish to change from the **Event Details Option Menus** drop-down list.
3. Click **Add**. The Add/Edit Option dialog box appears.
4. Enter the new option name in the **Option Name** field.
5. Enter the same name in the **Display Menu** field.
6. If the new submenu is being added to another submenu, enter the name of the parent submenu in the **Submenu** field.
7. Click **Save**. The Options for Currently Selected Menu table updates with the new option.

> **Note:** When changing an existing event details option to use cascading drop down menus, a configuration change to an Event Details XML file (`EVENTDETAILS_PNL_ACTIONS.inc`) is also needed. You will need to edit the ComboBoxBehavior element by adding the display_menu and submenu attributes. For more information, see the Event Details Configuration section of the *Oracle Utilities Network Management System Configuration Guide*.

Example: the **Failure** menu's **Conductor** option submenus **Cable - UG** (options shown) and **OH**:



Adding an Option

To add a new option to an option menu, complete the following steps:

1. Select the **Event Type** whose option menu you wish to change.
2. Select the option menu you wish to change from the **Event Details Option Menus** drop-down list.
3. Click **Add**. The Add/Edit Option dialog box appears.
4. Enter the new option name in the **Option Name** field.
5. Leave the **Display Menu** field blank.
6. If the option is being added to a submenu, enter the name of the submenu in the **Submenu** field.
7. Click **Save**. The Options for Currently Selected Menu table updates with the new option.

   Note: If the option name already exists, an error will appear and you will have to modify the name.

Removing an Option

To remove an option from an option menu, complete the following steps:

1. Display the **Event Details Options** tab on the Configuration Assistant window.
2. Select the **Event Type** whose option menu you wish to change.
3. Select the option menu you wish to change from the **Event Details Option Menus** drop-down list.
4. Select the option you wish to remove from the **Options for Currently Selected Menu** table.
5. Click the **Remove** button. A confirmation dialog box appears.
6. Click **Yes** to go ahead and remove the option. Click **No** to cancel the removal.

Editing an Option

To edit an existing option, complete the following steps:

1. Display the **Event Details Options** tab on the Configuration Assistant window.
2. Select the Event Type whose option menu you wish to change.
3. Select the option menu you wish to change from the Event Details Option Menus drop-down list.
4. Select the option you wish to edit from the Options for Currently Selected Menu table.
5. Click the **Edit** button. The Add/Edit Option dialog box appears.
6. Make the desired changes.
7. Click **Save** to save the new option. The Options for Currently Selected Menu table updates with the edited option.

   Note: If you enter the name of an option that already exists, an error dialog box appears.

Saving Exported Event Details Configuration

To generate and save SQL statements for the current state of the configuration associated with the Event Details Options tab, complete the following steps:

1. Display the **Event Details Options** tab on the Configuration Assistant window.
2. Click the **Export Configuration...** button beneath the Options for Currently Selected Menu table. A dialog box appears indicating that the configuration is being generated.
3. Once the generation is finished, the Generated Configuration dialog box appears.
    - To save the generated SQL statements to a file, click **Save**. The Save Configuration File dialog box appears. Type a name for the file into the **File name** field. The Save Configuration File dialog box disappears.
    - To print out the generated SQL statements, click **Print**. The Print Preview dialog box appears.
    - Click the **Cancel** button to close the Generated Configuration dialog box.

Reordering Options

To change the order of the options on an option menu, complete the following steps:

1. Select the Event Type whose option menu you wish to change.
2. Select the option menu you wish to change from the Event Details Option Menus drop-down list. The **Options for Currently Selected Menu** table populates with the options for the selected option menu and event type.
3. Select an option in the table that you wish to move in the list. The arrows to the right of the column are now sensitized.
4. Use the arrow buttons to rearrange options:
    - Click the **Move to top** button ( ) to move the selected user type up to the top of the list.
    - Click the **Move up** button ( ) to move the selected user type up one position in the list.
    - Click the **Move down** button ( ) to move the selected user type down one position in the list.
    - Click the **Move to bottom** button ( ) to move the selected user type to the bottom of the list.

Using the Schematica Options Tab

The **Schematica Options** tab allows an administrator to configure the options for the initial schematic generation.

Understanding the Schematica Options Pane Components

The **Schematica Options** tab allows you to add, edit, remove, and execute the contents of each of the option. The **Schematica Options** tab displays the following fields and buttons:

- The **Schematica Options Pack** drop-down list allows you to select the option package to use for schematic generation.
- The **Options Category** radio buttons allow you to the view options categorically for the selected option package (for example, execution options, feeder extent options, feeder grouping options, layout options, advanced layout options, class specification options).
- The **Options settings for selected option pack** table populates with the currently configured options for the selected option package and category.
- **Buttons**
  - **Create Copy:** Allows you to create a copy of the existing option package.
  - **Add:** Allows you to add a new option to the selected category for the selected option package.
  - **Remove:** Allows you to remove the selected option.
  - **Edit:** Allows you to edit the selected option.
  - **Run:** Allows you to run the schematic generation for the selected option package.
  - **Export Configuration...:** Generates SQL statements for the current state of the configuration associated with the **Schematica Options** tab. These SQL statements may then be saved to a file and/or printed.

Working with Schematica Options Tab Functions

Creating a Copy Pack

Create Copy allows you to create a copy of the existing schematica option packages. The copy may then be edited to add new options and modify existing options. To create copy for new option package, complete the following steps:

1. Click **Create Copy**.
2. In the **Copy Option Pack** dialog box, select the copy pack from the **Copy Pack** drop-down list.
3. In the **New Pack** field, enter a name for the new pack.
4. Click **Save**.

   The **Schematica Options Pack** drop-down list will display the new option pack and the Options settings for selected option pack table will display the initial options in the copied pack. You can then modify the pack options.

Adding an Option

To add a new option to an option package, complete the following steps:

1. Select the option package from the Schematica **Option Package** drop-down list that you want to add the new option to.
2. Select the category form **Options Category**.
3. Click **Add**. The Add/Edit Option dialog box appears.
4. Enter the new option name in the **Option Name** field.
5. Enter the option value in the **Option Value** field.
6. Click **Save**. The **Options** settings for selected option package table updates with the new option.

   Notes:

   - If the option name already exists, an error will appear and you will have to modify the name.
   - Option names and syntax are documented in *The Oracle Utilities Network Management System Configuration Guide*.

Removing an Option

To remove an option from an option package, complete the following steps:

1. Select the option package from the **Schematica Option Package** drop down from which you wish to delete an option.
2. Select the category form **Options Category** under the option you wish to delete belongs to.
3. Select the option you wish to remove from the **Options** settings for selected option package table.
4. Click **Remove**. A confirmation dialog box appears. Click **Yes** to remove the option; click **No** to cancel the removal.

Editing an Option

To edit an existing option, complete the following steps:

1. Select the option package from the **Schematica Option Package** drop down under which the option you wish to edit comes under.
2. Select the category form **Options Category** whose option you wish to edit.
3. Select the option you wish to edit from the **Options** settings for selected option package table.
4. Click **Edit**. The **Add/Edit** Option dialog box appears. Make the desired changes.
5. Click **Save** to save the new option. The Options settings for selected option package table updates with the edited option.

Running the Schematic Generation

The **Run** button allows you to generate the schematic output for the selected option package. To generate the schematics and view results in the Web Workspace Viewer, complete the following steps:

1. Select the Option Package from the Schematica Option Package drop down for which you want to run the schematic generation
2. Click **Run**. The **Maps to Generate** dialog box opens. It defaults to **All Maps** radio button.
   - If you wish you to run the configured options on all maps, leave the selection as is, click **OK**, and view the results in the Viewer.
   - If you wish to apply the configured options only for specific maps, then select the Specific Maps radio button, and add the maps you wish run on in the **Specific Maps** field. Click **OK** and view the results in the Viewer.

     Note: To view the output of the Schematic generation for any errors or warnings, complete the following steps:
     - Open a terminal and go to the logs folder (cd logs).
     - Open **nms_schematica_output** file to view the output (`vi nms_schematica_output`).

Saving Exported Schematica Options Configuration

To generate and save SQL statements for the current state of the configuration associated with the **Schematica Options** tab, complete the following steps:

1. Select the **Schematica Options** tab.
2. Click **Export Configuration...**. A dialog box appears indicating that the configuration is being generated.
3. Once the generation is finished, the Generated Configuration dialog box appears.
   - To save the generated SQL statements to a file, click **Save**. The Save Configuration File dialog box appears. Enter a name for the file in the **File name** field.
   - To print the generated SQL statements, click **Print**. The Print Preview dialog box appears.
   - Click the **Cancel** button to close the Generated Configuration dialog box

Using the Feeder Management Tab

The Feeder Management tab allows you to configure DMS application modes on per feeder basis and modify the feeder color that is displayed in the Viewer.

Menus

Actions Menu

Menu Option	Description
Assign Color...	Opens a dialog box that allows you to select a feeder color.
PF Mode	Allows you to set the PF Mode for the selected feeder: • kVA • Power Flow • Disabled
PF History	Allows you to maintain the power flow results history in the database for the selected feeder: • Enable • Disable
FLM Status	Allows you to set the FLM mode for the selected feeder: • Forecasting • Custom Forecasting • Real-Time • Disable
FLISR Status	Allows you to set the FLISR mode for the selected feeder: • Automatic • Manual • Disable • Restore Only
FLA Status	Allows you to set the FLA mode for the selected feeder: • Disable • Sustained • Momentary and Sustained **Note:** See **Global FLA Versus Individual Feeder FLA Configuration** on page 19-10 for more information on FLA status.

Menu Option	Description
Optimization Status	Allows you to set the Optimization mode for the selected feeder: • Automatic (Slow Cycle) • Automatic (Fast Cycle) • Manual (Slow Cycle) • Manual (Fast Cycle) • Disable • **Note:** When a feeder is set for **Disable** mode, the tool will restore the feeder's regulation devices to nominal during the next Optimization cycle. During this scenario, the plan may consist of a blend of optimization steps and return to nominal steps. For example, if a feeder on a bus that contains five feeders was set to **Disable**, the steps would consist of return to nominal for that feeder and optimization for the remaining four that are enabled.
Optimization Objective	Allows you to select the Optimization Objective for the feeder. • Conservation Voltage Reduction • Loss Minimization • Power Factor Correction • Relieve Violations • None
Protection Schemes	Allows you to select the Protection Scheme setting for the feeder. • Disable • Manual • Automatic
Protection Schemes Mode	Allows you to select the Protection Scheme Mode setting for the feeder. • Before • After
NCA Objective	Allows you to set the NCA objective for the selected feeder: • Ignore Pre-Existing Conditions • Consider Pre-Existing Conditions • Disable
Feeder Type	Allows you to select the Feeder Type. • Sub Transmission Transformer • Sub Transmission • Primary Transformer • Primary • Secondary Transformer • Secondary • None **Note:** The selections are based on the feeder types available in your model.

NMS Feeder Management Table

The NMS Feeder Management table has the following columns:

- The **Substation** column displays the substation name.
- The **Feeder** column displays the feeder name.
- **Source Color:** the name of the currently assigned feeder color.
- The **FLISR** column displays the FLISR mode of the associated feeder. A feeder can be in **Automatic**, **Manual**, or **Disabled** FLISR mode.
- The **FLM** column displays the FLM mode of the associated feeder. A feeder can be in **Forecasting**, **Custom Forecasting, Real-time**, or **Disabled** FLM mode.
- The **Optimization** column displays the **Optimization** mode of the associated feeder.
- The **FLA** column displays the FLA mode of the associated feeder.
- The **PF Mode** column displays the PF mode of the associated feeder.
- The **Optimization Objective** column displays the feeder's Optimization objective.
- The **Protection Schemes** column displays whether dynamic protection schemes are disabled or in manual or automatic mode.
- The **Protection Schemes Mode** column displays whether the protection scheme steps appear before or after the restoration switch step in Suggested Switching and FLISR switching plans.
- The **Feeder Type** column displays the feeder type.
- The **PF History** column displays the PF History mode of the selected feeder.
- The **NCA Objective** column displays the objective that is currently setup for the network capacity allocation analysis.

Buttons

The **Refresh** button refreshes the screen by reading the data from the database table. Any unsaved changes will be lost.

The **Service Recache** button causes the Oracle Utilities Network Management System services to recache with the changes you made in the Configuration Assistant window; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.

The **Save** button saves any changes you have made.

Modifying a Feeder DMS Application Mode

1. Select a feeder or multi-select a set of feeders.
2. Select the application from the **Actions** menu and choose the mode; alternatively, you may right-click and select the mode from the application in the context menu. For example, with a row selected, right-click and select **Forecasting** from the **FLM Status** option.

Changing Feeder Color

To change the color of a feeder, right-click the feeder row and select Assign Color..., which will open the **Choose a color for <feeder name>** dialog box. You may select from existing NMS colors or from the available color libraries (that is, swatches, HSV, HSL, RGB, or CMYK). Click **OK** to update to the selected color or **Cancel** to close the dialog box without making changes. Click **Reset** if you wish to return to the original color.

Using the State Transitions Tab

In Oracle Utilities Network Management System, events, switching sheets, safety documents, and damage assessment pass through different phases over their lifecycle. These phases are represented by *states*. Transitions between states are knows as state transitions. A transition between any two states happens when certain actions are performed by a user or the system.

The State Transitions tab allows you to view the state transitions of events, switching sheets, safety documents, and damage assessment in tabular and graphical views. The tab is divided into 3 panes:

- Selection Pane
- Tabular Section
- Graphical Section

1. **Selection Pane**

   State transitions in NMS are divided logically into multiple groups. The highest level division is based on the application (**APP**); the second level is based on sub-categorizations of the applications into groups (**Group**); the last level are states applicable to the application group.

   Filter Options Menus

   - **App**: the application type option menu lists codes for the NMS applications with state transitions:
     - **DA:** Damage Assessment
     - **SF:** Safety
     - **TE:** Trouble Events (generic for events)
     - **WSW:** Web Switching
   - **Group:** the group selection lists the available groups for the selected application. For example, if the application is TE, you may select OUT for outage events.
   - **States:** the states selection lists the available states for the chosen app-group combination. In addition to the specific states selection, you may choose **All States** to see all state transitions for the app-group combination.

   Buttons

   - **View:** Based on the selection of different combo boxes, on clicking this button, it will display the filtered set of transitions in table and graphical view.
   - **Refresh:** Refreshes the data by reading from the database table, but retains previously selected filters by user.

2. **Tabular Section**

   The table displays transitions in tabular view and contains following columns:

   - **APP**: Application name
   - **TRANS_KEY**: unique key of transitions
   - **TRANS_GROUP_KEY**: transition type (OUTAGE/MEET).

- **FROM_STATE_KEY**: unique value for state (from).
- **TO_STATE_KEY**: unique value for state (to).
- **TRANS_ACT_KEY**: unique value for action.
- **DESCRIPTION**: description of this state transition.

3. **Graphical Section:**

   The transitions from the table are displayed in a hierarchical view in this section. States are displayed as rectangular boxes labeled with the state name. Transitions are displayed with arrow symbols beginning at the *from state* and ending at the *end state* with the action name of the transition on top of the edge. When you select an arrow in the graphical view, the corresponding table row will be highlighted.

Viewing State Transitions

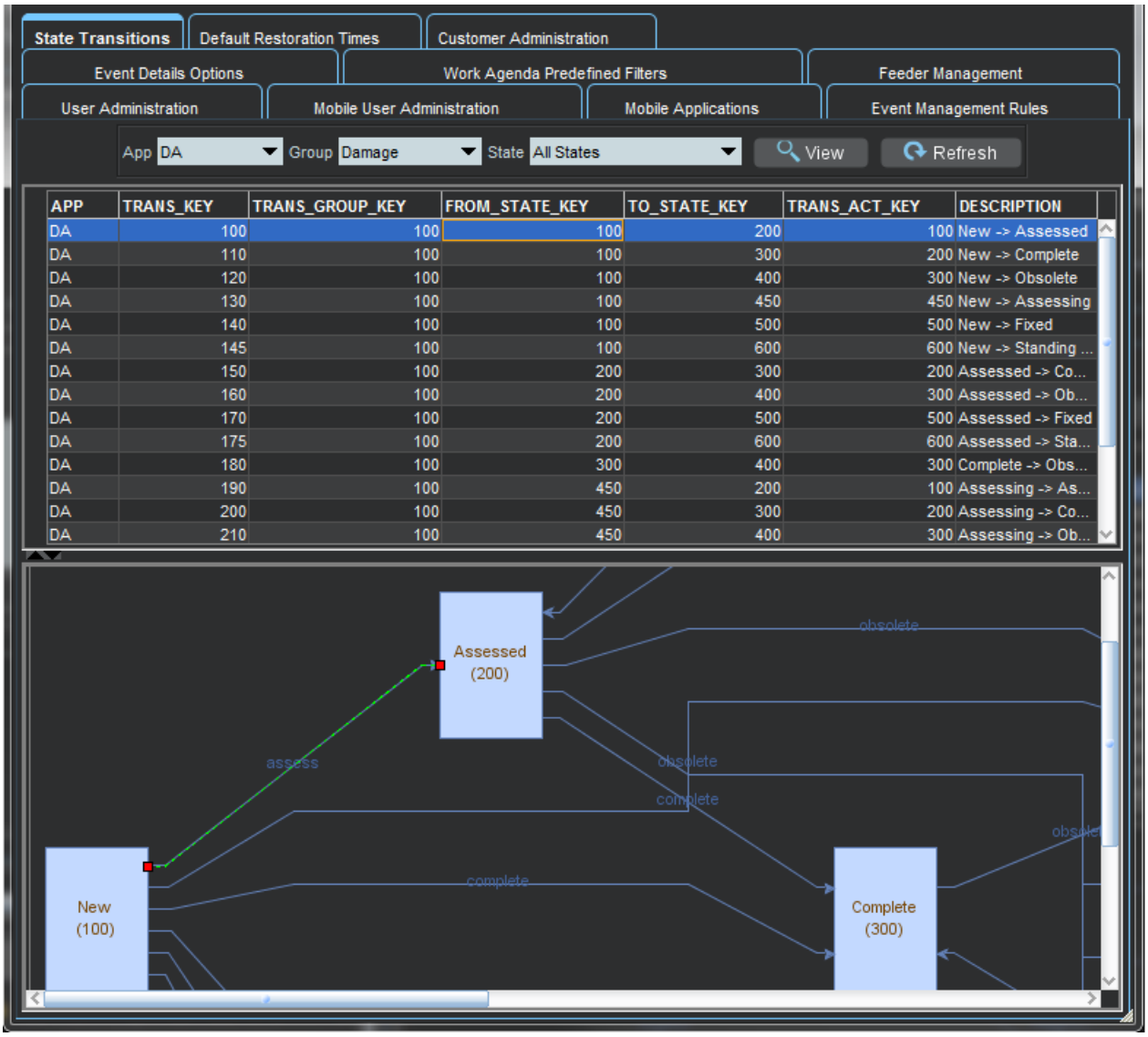
To view state transitions, do the following:

1. Select the application from the **App** options menu.
2. Select the group from the **Group** options menu.
3. Select a specific state from the **State** options menu.
4. Click **View**.

The table and graph will be updated for the state transitions applicable to your selection.

Example: New Damage Assessments State Transitions

1. Select **DA** from the **App** menu.
2. Select **Damage Assessment** from the **Group** menu.
3. Select **New** from the **State** menu.
4. Click the arrow that starts at the **New** box and ends at the **Assessed** box.


State Transitions
Default Restoration Times
Customer Administration
Event Details Options
Work Agenda Predefined Filters
Feeder Management
User Administration
Mobile User Administration
Mobile Applications
Event Management Rules
App DA
Group Damage
State All States
View
Refresh
APP TRANS_KEY TRANS_GROUP_KEY FROM_STATE_KEY TO_STATE_KEY TRANS_ACT_KEY DESCRIPTION
DA 100 100 100 200 100 New -> Assessed
DA 110 100 100 300 200 New -> Complete
DA 120 100 100 400 300 New -> Obsolete
DA 130 100 100 450 450 New -> Assessing
DA 140 100 100 500 500 New -> Fixed
DA 145 100 100 600 600 New -> Standing ...
DA 150 100 200 300 200 Assessed -> Co...
DA 160 100 200 400 300 Assessed -> Ob...
DA 170 100 200 500 500 Assessed -> Fixed
DA 175 100 200 600 600 Assessed -> Sta...
DA 180 100 300 400 300 Complete -> Obs...
DA 190 100 450 200 100 Assessing -> As...
DA 200 100 450 300 200 Assessing -> Co...
DA 210 100 450 400 300 Assessing -> Ob...
Assessed (200)
obsolete
assess
obsolete
complete
New (100)
complete
Complete (300)

Using the Default Restoration Times Tab

The Default Restoration Times tab on the Configuration Assistant window displays the current default restoration time configuration and allows you to modify the ERT values for each device class by control zone.

> **Note**: To change the system-wide default restoration time, see **Setting the System-Wide Estimated Restoration Time** on page 3-61.

Device/Zone Default Restoration Times Pane

The Device/Zone Default Restoration Times pane provides a tabular view that provides the relationship between a control zone, a device, and the default restoration time that has been set for them.

Columns

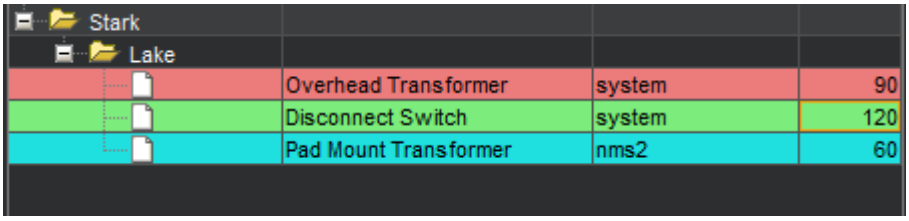
- The **Control Zone** column displays the control zone name.
- The **Device Class** column displays the device class name.
- The **User** column lists the user who configured the default restoration time.
- The **Default Restoration Times (minutes)** column displays the number of minutes to be used for the default restoration time for this control zone-device class combination.

Buttons

- **Add:** Opens the Add Default Restoration Time dialog box.
- **Remove:** Marks the selected default restoration time for deletion.
- **Save:** Saves any changes you have made.
- **Refresh:** Refreshes the screen. If you have any unsaved changes, the system asks if you want to save them.
- **Export Configuration:** Opens the Generated Configuration window, which displays the SQL statements used to generate the current configuration.

Row Highlighting

The table uses row highlighting to indicate changes that have not been saved. Red indicates that the row is marked for removal, green indicates the row has been edited, and light blue indicates that the row has been added.



Adding a Device/Zone-Based Default Restoration Time

To add a default restoration time for a specific device class-control zone combination, follow these steps:

1. Click **Add**. The Add Default Restoration Time window appears.
2. Click the **Control Zone Selection** button to display a list of control zones.
3. Select a Control Zone and click **OK**.
4. Click the **Select** button to display a list of device classes.
5. Select a device class and click **OK.**
6. Modify the Restore Time (minutes) field, as necessary.
7. Click **OK**. The Device/Zone Default Restoration Times pane refreshes with a new row, which is highlighted in light blue to show the addition.
8. Click **Save** to commit the addition.

   Note: If you decide against adding the new Default Restoration Time, click **Refresh**. The system will prompt you to save changes; click **No**.

Modifying a Device/Zone-Based Default Restoration Time

To edit an existing default restoration time, do the following:

1. Double-click the Default Restoration Time cell to open it for editing.
2. Edit the value.
3. Click anywhere outside the cell to finish the edit. The row will be highlighted in green to indicate the pending change.
4. Click **Save** to commit the change.

   Note: If you decide not to save changes, click **Refresh**. The system will prompt you to save changes; click **No**.

Deleting a Device/Zone-Based Default Restoration Time

To edit an existing default restoration time, do the following:

1. Select the row to be removed.
2. Click **Remove**. The row will be marked for removal pending saving changes. **T**he row will be highlighted in red to indicate the pending change.
3. Click **Save** to commit the change.

   Note: If you decide against deleting the row, click **Refresh**. The system will prompt you to save changes; click **No** to confirm the refresh.

Saving an Exported Default Restoration Time Configuration

To generate and save SQL statements for the current state of the configuration associated with the Default Restoration Times tab, complete the following steps:

1. Click the **Export Configuration...** button beneath the Device/Zone Default Restoration Times table.
2. Once the generation is finished, the Generated Configuration dialog box appears.
    - To save the generated SQL statements to a file, click **Save**. The Save Configuration File dialog box appears. Type a name for the file into the **File name** field. The Save Configuration File dialog box disappears.
    - To print out the generated SQL statements, click **Print**. The Print Preview dialog box appears.
    - Click the **Cancel** button to close the Generated Configuration dialog box.

Using the Limit Configuration Tab

The **Limit Configuration** tab allows you to define limit groups and corresponding limit sets and limit bands. The measurements modeled in these limit groups trigger associated quality codes and alarms when values fall into non-normal bands.

Understanding the Limit Groups Table

The Limit Groups table has the following columns:

- The **ID** column displays the limit group number. This is a non-editable field that corresponds to the measurement **`limit_group_id`** field and is here for reference purposes.
- The **Group Name** column displays the Limit Group name.
- The **Description** column displays the description given to the Limit Group.

Buttons

- **Add Limit Group...:** Displays a dialog box that allows you to add a limit group.
- **Edit Limit Group...:** Displays a dialog box that allows you to edit the selected limit group.
- **Remove Limit Group...:** Removes the selected limit group.
- **Refresh:** Refreshes the entire tab.
- **Service Recache:** Notifies DDService to reload the new limit groups.
- **Export Configuration...:** Displays the SQL needed to create the data displayed in this tab.

  Note: Limit group IDs need to be unique.

Understanding the Limit Sets Table

The **Limit Sets** table is displayed when a row is selected in the **Limit Groups** table. It has the following columns:

- The **Set ID** column displays the limit set ID.
- The **Set Name** column displays the limit set name.
- The **Type** column displays whether this limit set should use the value of the measurement, or a percentage. Percentages are only supported against the amp rating or nominal voltage.
- The **Hysteresis** column displays the value threshold past the limit needed to exit a non-normal limit band.

Buttons

- **Add Limit Set...:** Displays a dialog box that allows you to add a limit set for the selected group.
- **Edit Limit Set...:** Displays a dialog box that allows you to edit the selected limit set.
- **Remove Limit Set...:** Removes the limit set from the selected group.

  Note: A limit set ID can only exist once in a single limit group.

Understanding the Limit Bands Table

The **Limit Bands** table is displayed when a row is selected in the **Limit Set** table. It has the following columns:

- The **Band ID** column displays the limit band ID.
- The **Band Name** column displays the limit band name.
- The **Min Value** column displays the minimum value of this band.
- The **Max Value** column displays the maximum value of this band.
- The **Description** column displays the band description.
- The **Priority** column displays the priority used in the resulting alarm.
- The **Enabled** column displays whether the band is active.

Buttons

- **Add Limit Band...:** Displays a dialog box that allows you to add a limit band.
- **Edit Limit Band…:** Displays the Add/Edit Limit Band dialog box to edit the parameters of the selected Limit Band.
- **Remove Limit Band...:** Displays a dialog box that will allow you to remove the selected limit band or cancel the action.

  Note: A limit band ID can only exist once in a single limit set. The band IDs should have no gaps between them.

Using the Alarm Configuration Tab

The Alarm Configuration tab allows you to define priorities, colors, and sounds for each alarm type. This controls the behavior for future alarms when they appear in the Alarms List tool (see **Using the Alarm Displays** on page 2-138).

The Alarm Configuration tab is comprised of pages for different alarm configuration options. The pages are provided in sub-tabs, which are described in the following sections.

- Understanding the Behavior Tab
- Understanding the Mapping Tab
- Understanding the Priorities Tab
- Understanding the Classes Tab
- Understanding the Categories Tab
- Understanding the Attributes Tab

Understanding the Behavior Tab

The **Behavior** tab consists of:

- A table containing the configuration rules (definitions) for all alarms and buttons for working with the alarm definitions.
- Alarm Definition Preview Panes
  - The Active Alarms table displays how a selected alarm definition would look in the Web Workspace Alarms list (See **Understanding the Alarms List** on page 2-138).
  - The Alarm History table displays how a selected alarm definition would look in the Web Workspace Alarm History (**Understanding the Alarm History List** on page 2-143).

Alarm Behavior Table

The Alarm Behavior table defines a set of alarm rules. Each rule defines name, a trigger, and a behavior for the alarm.

- The name is used to group multiple alarm rules into one alarm definition that can be associated with a SCADA measurement or System alarm.
- The trigger defines when the alarm is generated. An example of a trigger is an **Unexpected Open** event.
- The behavior defines how the alarm behaves after it is generated. For example, a behavior could require that the alarm be acknowledged.

Alarm Behavior Table Columns

- The **Name** column defines a common alarm definition name. The name is used to group multiple alarm rules names into one alarm definition.

  For example, a single bit digital alarm has two states (ON and OFF) and device can change through control or through an unsolicited change. In this case, the alarm definition would have four rows in the table for the following triggers:

- Expected OFF
- Expected ON
- Unexpected OFF
- Unexpected ON

When the device changes to ON as a result of an operator control request, an alarm will be generated that follows the behavior as defined by the **Expected ON** rule.

If a rule does not exist for a devices state, then an alarm will not be generated when the device changes to that state.

- The **Trigger Type** column defines the context around how a measurement changed state. The trigger type can be one of the following values:
  - **Expected:** A change in value caused by a control request
  - **Unexpected:** An unsolicited change in state of a SCADA measurement.
  - **Intermediate:** An open or close change for a switch with an associated auto-recloser where the auto-recloser is still attempting to close the switch.
  - **Manual:** A change due to a manual entered value by the operator.
  - **Override:** A change due to a manual override by the operator.
  - **Inhibit:** A inhibit has been applied to the SCADA measurement.
  - **Quality:** A change in a quality code for a SCADA measurement.
  - **Cleared:** The clearance of a quality code for a SCADA measurement.
  - **System:** A system generated event.
  - **Limit Band:** A change in limit band.
- The **Trigger Value** column defines the NMS Value for a SCADA measurement that will cause the alarm to be generated. If the **Trigger Value** has no value, then this means that the alarm rule applies to all values. For example, an alarm rule with a **Trigger Type** of **Unexpected** and no **Trigger Value** for a single bit digital, would be used for any unexpected change in value of the device.

  The **Trigger Type** in conjunction with the **Trigger Value** defines which alarm rule will be used to generate an alarm.

  A typical alarm definition for a single bit digital would have the following trigger conditions:

  - Expected ON
  - Expected OFF
  - Unexpected ON
  - Unexpected OFF
  - Manual
  - Override
  - Inhibit

  Note: The manual, override, and inhibit Trigger Types have no Trigger Value and are used for any ON or OFF change in value.

A typical alarm definition for an analog with high and low limits configured would gave the following trigger conditions:

- **Limit Band 1:** Used when the analog enters the high (Hi) limit.
- **Limit Band -1:** Used when the analog enters the low (Lo) limit.
- **Limit Band R:** Used when the analog value enters the reasonability limits.
- **Limit Band ~:** The ~ (tilde) rule is triggered when the limit band enters the normal range.

A typical alarm definition for a normally closed switch with an associated auto-recloser would contain the following trigger conditions:

- Expected
- Unexpected Open
- Unexpected Close
- Intermediate
- Manual
- Override
- Inhibit

Note: The Expected, Intermediate, Manual, Override, and Inhibit **Trigger Types** have no **Trigger Value** and are applicable to both the Open and Close changes in value. The Unexpected **Trigger Type** used different rules for the Open and Close alarms, which is typically to assign a higher priority to the Open alarm.

- The **Priority** column defines the priority of the alarm. The priorities are configured in the **Priorities** tab.
- The **Class** column defines the alarm classification. The classes are configured in the **Classes** tab and allow alarms to be grouped into common classes (for example, System, SCADA, and so on).
- The **Category** column define the alarm category. The categories are configured in the **Categories** tab and each class has a set of associated categories.
- The **Requires Ack** column defines whether the alarm must be acknowledged by the operator before it becomes inactive and is removed from the alarm list. If an alarm does not require operator acknowledgment, then the system will automatically acknowledge it.
- The **Standing** column defines the alarms behavior once it has been acknowledged by the operator. If an alarm is standing, then it will only be removed from the alarm list once the following two conditions are met:
  - It has been acknowledged by the operator or system.
  - The alarm condition is no longer present.

  In conjunction, the **Requires Ack** and **Standing** columns control when and if an alarm is seen in the Alarms list. Regardless of these settings, the alarm will always appear in the Alarm History.

  A typical configuration for a switch would be:

  - Expected OPEN, Requires Ack = NO, Standing = NO

- Expected CLOSE, Requires Ack = NO, Standing = NO
- Unexpected OPEN, Requires Ack = YES, Standing = YES
- Unexpected CLOSE, Requires Ack = YES, Standing = NO

If an alarm is generated as a result of an operator control request to open or close the device then the alarms do not require acknowledgment and are not standing and therefore do not appear in the Alarm List.

If an alarm is generated as a result of an unexpected OPEN, then the alarm appears in the Alarms list as unacknowledged. If the operator acknowledges the alarm, then the alarm will remain in the Alarms List and will only be removed when the switch closes again (either through an unexpected event or control).

If an alarm is generated as a result of the unexpected CLOSE, then the alarm appears in the Alarms list as unacknowledged. If the operator acknowledges the alarm, then the alarm is removed from the Alarms list.

- The **Latched** column defines whether the alarm should be treated as a latched alarm. In the field a latched relay will be set and always immediately reset. In this case two alarms are always generated, the ON then OFF alarm. However we do not wish the OFF alarm to replace the ON alarm in the Alarm List.

  A typical configuration for a latch relay would be:

  - Unexpected ON, Requires Ack = YES, Is Standing = YES, Latched = YES
  - Unexpected OFF, Requires Ack = NO, Standing = NO

  If the ON alarm is generated, it appears in the Alarms list and must be acknowledged by the operator. When acknowledged, it remains in the alarm list.

  If the ON alarm is generated and then the OFF alarm is generated (before the operator has a chance to acknowledge the ON alarm), then the ON alarm remains in the Alarm List and is unacknowledged. Once acknowledged, the alarm is removed from the Alarms list. The OFF alarm never appears in the Alarms list.

  If the ON alarm is generated and acknowledged by the operator (so that it remains standing) and the OFF alarm is subsequently generated, the ON alarm is removed from the Alarms list. The OFF alarm never appears in the Alarms list.

- The **Single** column defines whether this alarm should act as a single alarm or should be automatically grouped in the Alarms list with any other unacknowledged alarms for this device and this alarm definition. Normally alarms are not configured as single alarms and this means that each alarm generated replaces the last alarm in the Alarms list (or becomes the last alarms parent if the last alarm was not acknowledged). If the alarm is configured as a single alarm, then it will never be replaced by any new alarm.

  A typical example of a non-single alarm definition would be:

  - Unexpected ON, Requires Ack = YES, Standing = NO, Single = NO
  - Unexpected OFF, Requires Ack = NO, Standing = NO, Single = NO

  If the Unexpected ON alarm is generated, it is shown in the Alarms list and requires acknowledgment.

  If the Unexpected OFF alarm is subsequently generated, it replaces the ON alarm in the Alarm List. The ON alarm becomes a child alarm of the OFF alarm as it has not been acknowledged.

A typical example of a single alarm definition would be:

- Unexpected ON, Requires Ack = YES, Standing = NO, Single = YES
- Unexpected OFF, Requires Ack = NO, Standing = NO, Single = YES

If the Unexpected ON alarm is generated it is shown in the Alarm List and requires acknowledgment.

If the Unexpected OFF alarm is subsequently generated, it does not replace the ON alarm in the Alarm List.

- The **Ack Outstanding** column determines whether an alarm should automatically acknowledge any unacknowledged alarms for the device and alarm definition in the Alarms list. Normally when an alarm replaces another unacknowledged alarm, then the older alarm is added as a child alarm of the newer alarm. If the newer alarm is configured to acknowledge outstanding alarms, then the older alarm is instead automatically acknowledged and removed from the Alarms list.

  A typical example would be:

  - Unexpected ON, Requires Ack = YES, Standing = NO, Ack Outstanding = YES
  - Unexpected OFF, Requires Ack = YES, Standing = NO, Ack Outstanding = YES

  If the Unexpected ON alarm is generated, it is shown in the Alarms list and requires acknowledgment by the operator.

  If the Unexpected OFF alarm is subsequently generated the ON alarm is automatically acknowledged and removed from the Alarm List. The OFF alarm remains in the Alarm List and is unacknowledged.

- The **Text Before** column determines the text at the beginning of the alarm message.

  A typical example would be:

  - Trigger type = Unexpected. Text Before = Unsolicited
  - Trigger type = Expected, Text Before = Solicited

  An unexpected alarm would generate an alarm message:

  ```
  Unsolicited <rest of message>
  ```

  An expected alarm would generate an alarm message:

  ```
  Solicited <rest of message>
  ```

- The **Text After** column determines the text at the end of the alarm message.

  A typical example would be:

  - Trigger type = Unexpected. Text Before = Unsolicited, Text After = Event

  An unexpected alarm would generate an alarm message

  ```
  Unsolicited <rest of message> Event
  ```

- The **Show Value** column determines whether the value that caused the alarm to be generated should appear in the alarm message.

  A typical example would be:

- Trigger type = Unexpected, Trigger value = OPEN, Text Before = Unsolicited. Show Value = YES

An unexpected OPEN alarm would generate an alarm message:

```
Unsolicited OPEN
```

- The **Show Units** column determines whether the units of the SCADA measurement are displayed in the alarm.

  A typical example would be:

  - Show Value = YES, Show Units = YES

  An analog alarm for an amps measurement with a value of 10 and units of A would generate an alarm message:

  ```
  10A
  ```

- The **Show Limit** column determines whether the limit value is displayed in the alarm message. This is typically used for limit alarms to allow both the analog value and the limit value to be displayed.

  A typical example would be:

  - Show Value = YES, Show Units = YES, Show Limit = Yes

  An analogue alarm for an amps measurement with a value of 10, units of A and low limit of 12 would generate an alarm message:

  ```
  10A (12A)
  ```

- The **Limit Text** column allows some additional text to be added before the limit value in the alarm message.

  A typical example would be:

  - Show Value = YES, Show Units = YES, Show Limit = Yes, Limit Text = Limit

  An analog alarm for an amps measurement with a value of 10, units of A, low limit of 12, and limit text of Limit would generate an alarm message of:

  ```
  10A (Limit 12A)
  ```

- The **Attachment** column allows a document attachment to be associated with the generated alarm.
- The **User Comment** column allows an operator to add a description to the alarm rule.
- The **Active** column defines whether the rule is used by the system or not.

Context Menu Options

The following context menu options are available when you right-click a table row.

- **Add A New Definition…:** Opens the Add / Edit Alarm Definition dialog box to allow a new alarm rule to be created.
- **Add Row To Definition…:** Opens the Add / Edit Alarm Definition dialog box to allow a new alarm rule to be created. The **Name** field is populated with the selected row's name.

- **Edit…:** Opens the Add / Edit Alarm Definition dialog box with the selected row's values.
- **Remove:** Deletes the selected row.
- **Preview Alarm:** Displays what the selected alarm would look like in the **Active Alarms** and the **Alarm History** lists when triggered.

Buttons

- **Add Definition…:** Opens the Add / Edit Alarm Definition dialog box to allow a new alarm rule to be created.
- **Add Row To Definition...:** Opens the Add / Edit Alarm Definition dialog box to allow a new alarm rule to be created. The **Name** field is populated with the selected row's name.
- **Remove…:** Deletes the selected alarm rule.
- **Edit…:** button invokes the Add / Edit Alarm Definition dialog box with the selected row's values.
- **Clear Preview:** Removes the alarm preview from the **Active Alarms** and the **Alarm History** lists.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new alarm rules you configured; if you do not recache, your saved changes will not be recognized until services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Understanding the Add / Edit Alarm Definition Dialog Box

The Add / Edit Alarm Definition dialog box allows you to create or edit existing alarm rules. The tool has the following fields:

- **Name:** The alarm definition name.
- **Trigger Type:** The alarm trigger type.
- **Trigger Value:** The alarm trigger value.
- **Priority:** The alarm priority.
- **Class:** The alarm class.
- **Category:** The alarm category.
- **Before Text:** The alarm message before text.
- **After Text:** The alarm message after text.
- **Requires Acknowledgment:** Whether the alarm requires acknowledgment or not.
- **Ack Outstanding:** Whether the alarm will acknowledge outstanding alarms or not.
- **Is Standing:** Whether the alarm is standing or not.
- **Is Latched:** Whether this is a latch alarm.
- **Is Single:** Whether this is a single alarm.
- **Show Value:** Whether the SCADA measurements alarm value should be shown in the alarm message.
- **Show Units:** Whether the SCADA measurements units should be shown in the alarm message.
- **Show Limit:** Whether the SCADA measurements limit value should be shown in the alarm message.
- **Limit Text:** Whether configurable limit text should be shown in the alarm message.
- **Attachment:** Any attachment.
- **User Comment:** A configurable user comment.
- **Active:** Whether the rule is active or not.

The following buttons are available:

- **Save Changes:** Saves the alarm rule and closed the dialog.
- **Cancel Edit:** Cancels the action and closes the dialog.

Understanding the Active Alarms List

The Active Alarms list is used to preview alarm definitions that are selected in the Behavior table.

The default Active Alarms list columns are:

- The **+** column contains a count of the number of child alarms associated with an alarm in the alarm list. The alarm count can be clicked and this will change the Alarm List into the selected alarms child view displaying the child alarms associated with the parent alarm.
- The **Unacknowledged** column contains a bell icon if the alarm is unacknowledged.
- The **Attribute** column contains the type of SCADA measurement or type of System alarm.
- The **Priority** column contains the priority associated with the alarm. The priority field's background is filled with the priorities associated color while the alarm is not acknowledged.
- The **Alarm Time** column contains the time the alarm was generated in the field. For a SCADA alarm this is the timestamp supplied by the RTU.
- The **Class** column contains the alarm class associated with the alarm.
- The **Category** column contains the alarm category associated with the alarm.
- The **Alarm** message column contains the alarm text

The following right click options are available:

- **Acknowledge:** Acknowledge the selected alarm.
- **Silence:** Silence the selected alarm.
- **Clear:** Clear the selected alarm from the Alarm List.

Understanding the Alarm History List

The Alarm History list is used to preview the alarm definition selected in the Behavior table. The default Alarm History columns are:

- The **Unacknowledged** column contains a bell icon if the alarm is unacknowledged.
- The **Attribute** column contains the type of SCADA measurement or type of System alarm.
- The **Priority** column contains the priority associated with the alarm. The priority field's background is filled with the priorities associated color while the alarm is not acknowledged.
- The **Alarm Time** column contains the time the alarm was generated in the field. For a SCADA alarm this is the timestamp supplied by the RTU.
- The **Class** column contains the alarm class associated with the alarm.
- The **Category** column contains the alarm category associated with the alarm.
- The **Alarm** Message column contains the alarm text

The following right click options are available:

- **Acknowledge:** Acknowledge the selected alarm.

Understanding the Mapping Tab

The Mapping Tab contains the mapping table that allows you to map a SCADA measurement or System Alarm to an alarm definition defined the Behavior tab.

The Mapping table contains the following columns:

- The **Attribute** column defines the SCADA measurement or System Alarm.
- The **Device Class** column defines the device class associated with the mapping. This allows you to configure different alarm definitions for the same SCADA measurement. If you want all devices classes to use the same alarm definition set this value to All Classes.
- The **Normal State** column defines whether this mapping relates to a normally open or a normally closed device. If you do not want to differentiate between normally open and normally closed devices in an alarm mapping then this column should be left blank.
- The **Alarm Def** column defines what alarm definition the mapping should use.
- The **Active** column defines whether this row is active or not.

A typical example would be:

- Attribute = Topology Status, Normal State = OPEN, Alarm Defn = Normally Open Definition
- Attribute = Topology Status, Normal State = CLOSED, Alarm Defn = Normally Closed Definition

This maps every topology status attribute to one of two different alarm definitions based on whether the device is normally open or closed.

Context Menu Options

- **Add New Mapping…:** Opens the Add / Edit Alarm Mapping dialog box to allow a new row to be created.
- **Edit…:** Invokes the Add / Edit Alarm Mapping dialog box to allow the selected row to be edited.
- **Remove:** Removes the alarm mapping.

Buttons

- **Add …:** Opens the Add / Edit Alarm Mapping dialog box to allow a new mapping to be created.
- **Remove…:** Deletes the selected mapping.
- **Edit…:** Opens the Add / Edit Alarm Mapping dialog box with the selected rows values.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new alarm mappings you configured; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Using the Add / Edit Alarm Mapping Dialog Box

The Add / Edit Alarm Mapping dialog box allows you to create or edit existing alarm mapping. The dialog box has the following fields:

- The **Attribute** column defines the SCADA measurement or System Alarm.
- The **Device Class** column defines the device class associated with the mapping.
- The **Normal State** column defines whether this mapping relates to a normally open or a normally closed device.
- The **Alarm Def** column defines what alarm definition the mapping should use.
- The **Active** column defines whether this row is active or not.

The following buttons are available:

- **Save Changes:** Saves the alarm mapping and closes the dialog box.
- **Cancel Edit:** Cancels the action and closes the dialog box.

Understanding Attributes and System Alarms

The following meaning is applied to the value of **Attributes** in the NMS system. This must be strictly adhered to by the system.

All system alarms must have a **Trigger Type** set to system. The **Trigger Value** for each system alarm is as follows:

- **STATUS:** Attribute 0 this represents the topology status.

- **DIGITAL_MEASUREMENT** range from 1 to 999
- **ANALOG_MEASUREMENT** range from 1000 to 1999
- **EQUIPMENT_MEASUREMENT** range from 2000 to 2999
- **CONDITION** classes range from 3000 to 4999
- **SYSTEM:** Attribute 5000 and above are reserved for system alarms.
  - **Blank Trigger Value:** One alarm rule with no Trigger Value is used to configure general system alarms.
- **MODEL_EDIT:** Attribute 5001 is reserved for model edit system alarms.
  - **Blank Trigger Value:** One alarm rule with no Trigger Value is used to configure general system alarms.
- **FLA_ALARM:** Attribute 5002 is reserved for FLA system alarms.
  - **Blank Trigger Value:** the default FLA alarm rule if no Trigger Value matches.
    - **3:** FLA Device Information
    - **6:** FLA Feeder Information
    - **8:** FLA Global Information
    - **10:** FLA Trip Device Information
    - **13:** FLA global disable alarm
    - **16:** FLA global error alarm.
- **FLISR_EXECUTION:** Attribute 5003 is reserved for FLISR execution alarms.
  - **0:** Solution Start
  - **1:** Solution End
  - **2:** Sheet Creation Start
  - **3:** Sheet Creation End
  - **4:** Sheet Execution Start
  - **5:** Sheet Execution End
  - **6:** Solution Error
  - **7:** Sheet Creation Error
  - **8:** Sheet Execution Error
- **FLISR_ALARM:** Attribute 5004 is reserved for FLISR alarms.
  - **Blank Trigger Value:** General FLISR alarm
    - **3:** FLISR Device Information
    - **6:** FLISR Feeder Information
    - **8:** FLISR Global Information
    - **10:** FLISR Trip Device Information
    - **13:** FLISR global disable alarm
    - **16:** FLISR global error alarm

- **FLISR_MODE:** Attribute 5005 is reserved for FLISR mode alarms.
  - **0:** FLISR mode changed to disabled
  - **1:** FLISR mode changed to manual
  - **2:** FLISR mode changed to automatic
  - **3:** FLISR mode changed to Load Shed Disabled
- **VOLT_VAR_EXECUTION:** Attribute 5006 is reserved for Optimization execution alarms.
  - **0:** Solution Start
  - **1:** Solution End
  - **2:** Sheet Creation Start
  - **3:** Sheet Creation End
  - **4:** Sheet Execution Start
  - **5:** Sheet Execution End
  - **6:** Solution Error
  - **7:** Sheet Creation Error
  - **8:** Sheet Execution Error
  - **9:** Update start
  - **10:** Update end
  - **11:** Update error
- **VOLT_VAR_ALARM:** Attribute 5007 is reserved for Optimization alarms.
  - **Blank Trigger Value:** General VoltVAr alarm
    - **2:** VoltVAr device info alarm
    - **4:** VoltVAr feeder info alarm
    - **6:** VoltVAr bus info alarm
    - **8:** VoltVAr global info alarm
    - **10:** VoltVAr device error alarm
    - **12:** VoltVAr feeder error alarm
    - **14:** VoltVAr bus error alarm
    - **16:** VoltVAr global error alarm
- **VOLT_VAR_MODE:** Attribute 5008 is reserved for Optimization mode alarms.
  - **0:** VoltVAr mode changed to disabled
  - **1:** VoltVAr mode changed to manual
  - **2:** VoltVAr mode changed to automatic
  - **3:** VoltVAr mode changed to return to normal
- **PROT_SCHEME_EXECUTION:** Attribute 5009 is reserved for Protection Scheme alarms.
  - **0:** Protection Scheme sheet creation error

- **1:** Protection Scheme execution error
- **2:** Protection Scheme execution end
- **3:** Protection Scheme execution start

- **ANMS_EXECUTION:** Attribute 5010 is reserved for Active Network Management execution alarms.
  - **0:** ANMS sheet execution start
  - **1:** ANMS sheet execution end
  - **2:** ANMS solution error
  - **3:** ANMS sheet creation error
  - **4:** ANMS sheet execution error
- **RTI_MEASUREMENT:** Attribute 5011 is reserved for external SCADA interface measurement alarms.
  - **Blank Trigger Value:** General RTI measurement alarm.
- **RTI_SYSTEM_ALARM:** Attribute 5012 is reserved for external SCADA interface system alarms.
  - **Blank Trigger Value:** General RTI system alarm.
- **DYNAMIC_RATING:** Attribute 5013 is reserved for Dynamic Rating alarms.
  - **Blank Trigger Value:** General dynamic rating alarm.
    - **5:** Dynamic rating critical alarm
    - **8:** Dynamic rating alarm
    - **9:** Dynamic rating over alarm
- **SCADA_LINK:** Attribute 5014 is reserved for SCADA link interface alarms.
  - **Blank Trigger Value:** General SCADA link alarm
- **MULTISPEAK_ALARM:** Attribute 5015 is reserved for MultiSpeak interface alarms.
  - **Blank Trigger Value:** General MultiSpeak alarm
- **MOBILE_ALARM:** Attribute 5016 is reserved for Mobile system alarms.
  - **Blank Trigger Value:** General Mobile alarm
- **GENERAL_CONDITION_ALARM:** Attribute 5017 is reserved for general condition alarms.
  - **1:** Condition applied alarm
  - **2:** Condition removed alarm
- **CONTROL_REQUEST:** Attribute 5018 is reserved for control request alarms.
  - **1:** Control request sent
  - **2:** Control success
  - **3:** Control timeout
  - **4:** Control failed
- **ZONE_ALARM:** Attribute 5019 is reserved for zone alarms.

    - **Blank Trigger Value:** General zone alarm
- **ABNORMAL_ALARM:** Attribute 5020 is reserved for abnormal state alarms.
    - **1:** Abnormal state alarm
    - **2:** Normal state alarm
- **SMS_ALARM:** Attribute 5021 is reserved for SMS alarms.
    - **Blank Trigger Value:** General SMS alarm
- **FLM_ALARM:** Attribute 5022 is reserved for Feeder Load Management alarms.
    - **Blank Trigger Value:** General FLM alarm
        - **5:** FLM critical alarm
        - **8:** FLM alarm
- **ICCP_ASSOCIATION:** Attribute 5023 is reserved for ICCP association alarms.
    - **Blank Trigger Value:** General ICCP association alarm
- **ICCP_TRANSFER_SET:** Attribute 5024 is reserved for ICCP Transfer set alarms.
    - **Blank Trigger Value:** General ICCP event alarm
        - **1:** ICCP failed alarm
- **ICCP_SYSTEM_ALARM:** Attribute 5025 is reserved for ICCP system alarms.
    - **Blank Trigger Value:** General ICCP system alarm
- **SCADA_ERROR:** Attribute 5026 is reserved for SCADA errors in the SCADA NMS system.
    - **0:** Low priority alarm
    - **1:** Medium priority alarm
    - **2:** High priority alarm
- **SCADA_COMMS:** Attribute 5027 is reserved for SCADA communications errors in the SCADA NMS system.
    - **0:** Low priority alarm
    - **1:** Medium priority alarm
    - **2:** High priority alarm

Understanding the Priorities Tab

The Priorities tab defines the available alarm priorities in the system. Priorities can be optionally assigned a wav sound file that is played when an unacknowledged alarm is generated with that priority.

The Priority table has the following columns:

- The **Name** column defines the name of the priority
- The **Sound** column defines the wav file associated with the alarm priority.
- The **Active** column defines whether the priority is active or not.

Context Menu Options

- **Add New Priority…:** Invokes the Add / Edit Alarm Priority dialog box to allow a new row to be created.
- **Edit…:** Invokes the Add / Edit Alarm Priority dialog box to allow the selected row to be edited.
- **Remove:** Removes the alarm priority.

Buttons

- **Add…:** Opens the Add / Edit Alarm Priority dialog box to allow a new priority to be created.
- The **Remove…:** button Deletes the selected priority.
- **Edit…:** Opens the Add / Edit Alarm Priority dialog box with the selected rows values.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new alarm priorities you configured; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Using the Add / Edit Alarm Priority Dialog Box

The Add / Edit Alarm Priority dialog box allows you to create or edit existing alarm priority. The dialog box has the following fields:

- The **Name** column defines the name of the priority
- The **Sound** column defines the wav file associated with the alarm priority.
- The **Active** column defines whether the priority is active or not.

The following buttons are available:

- **Save Changes:** Saves the alarm priority and closed the dialog.
- **Cancel Edit:** Cancels the action and closes the dialog.

Understanding the Classes Tab

The Classes tab defines the available alarm classes in the system. The classes allow alarms to be broadly grouped into sensible classifications that can then be filtered on.

The Classes table has the following columns:

- The **Name** column defines the name of the class.
- The **Active** column defines whether the class is active or not.

The following right click options are available:

- **Add New Class…:** Opens the Add / Edit Alarm Class dialog box to allow a new row to be created.
- **Edit…:** Opens the Add / Edit Alarm Class dialog box to allow the selected row to be edited.
- **Remove:** Removes the alarm class.

The following buttons are available:

- **Add …:** Opens the Add / Edit Alarm Class dialog box to allow a new class to be created.
- **Remove…:** Deletes the selected class.
- **Edit…:** Opens the Add / Edit Alarm Class dialog box with the selected rows values.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new alarm classes you configured; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Using the Add / Edit Alarm Classes Dialog Box

The Add / Edit Alarm Classes dialog box allows you to create or edit existing alarm class. The tool has the following fields:

- The **Name** column defines the name of the class
- The **Active** column defines whether the class is active or not.

The following buttons are available:

- **Save Changes:** Saves the alarm class and closed the dialog.
- **Cancel Edit:** Cancels the action and closes the dialog.

Understanding the Categories Tab

The Categories tab defines the available alarm categories in the system. The categories allow alarms to be further categorized within an alarm class.

The Categories table has the following columns:

- The **Class** column defines the alarm class the category is associated with.
- The **Name** column defines the name of the category
- The **Active** column defines whether the category is active or not.

The following right click options are available:

- **Add New Category…:** Opens the Add / Edit Alarm Category dialog box to allow a new row to be created.
- **Edit…:** Opens the Add / Edit Alarm Category dialog box to allow the selected row to be edited.
- **Remove:** Removes the alarm category.

The following buttons are available:

- The **Add …** button opens the Add / Edit Alarm Category dialog box to allow a new category to be created.
- The **Remove…** button deletes the selected category.
- **Edit…:** Opens the Add / Edit Alarm Category dialog box with the selected rows values.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new alarm categories you configured; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Using the Add / Edit Alarm Categories Dialog Box

The Add / Edit Alarm Categories dialog box allows you to create or edit existing alarm categories. The tool has the following fields:

- The **Class** column defines the alarm class the category is associated with.
- The **Name** column defines the name of the category.
- The **Active** column defines whether the class is active or not.

The following buttons are available:

- **Save Changes:** Saves the alarm categories and closed the dialog box.
- **Cancel Edit:** Cancels the action and closes the dialog box.

Understanding the Attributes Tab

The Attributes tab contains metadata on the SCADA measurements within the system that is used by the alarm engine when grouping alarms and applying special meaning to a SCADA measurement.

The **Attributes** table has the following columns:

- The **Attribute** column defines the name of the SCADA measurement.
- The **Phase** column defines the phase associated with the SCADA measurement.
  - For the Topology Status measurement, this is set to ABC.
  - For analog measurements, this is set to the phase or phases associated with the measurement.
- The **Unganged** column defines whether this measurement should be treated as ganged or un-ganged by the alarm engine.
  - By default, the Topology Status measurement should be configured as ganged. The alarm engine will determine whether a switch is ganged or un-ganged based on its device class and the ganged SCADA measurement.
  - For analog measurements, if the measurement is associated with all phases this column should be set to **No**. If the analog is associated with a specific phase, then this should be set to **Yes**.
- The **Tag** column allows the alarm engine to group similar SCADA measurements together into parent and child alarms.
  - By default, the Topology Status measurement will automatically be grouped if it is un-ganged and this column should be left blank.
  - For analogs, associated SCADA measurements should be assigned the same tag. For instance, all amps SCADA measurements for each phase should be assigned the same tag (for example, Amps).
- The **Product** column is used to assign special meaning to a measurement. The following values are applicable:
  - **Blank:** the SCADA measurement has no special meaning in the alarm engine.
  - **0:** The SCADA measurement is the Topology Status measurement.

- **35:** The SCADA measurement is the Gang Operation Mode SCADA measurement.

- The **Active** column defines whether the attribute is active or not.

The following right click options are available:

- **Add New Attribute…:** Opens the Add / Edit Attribute dialog box to allow a new row to be created.
- **Edit…:** Opens the Add / Edit Attribute tool to allow the selected row to be edited.
- **Remove:** Removes the attribute.

The following buttons are available:

- **Add…:** Opens the Add / Edit Attribute dialog box to allow a new attribute to be created.
- The **Remove…** button deletes the selected attribute.
- **Edit...:** Opens the Add / Edit Attribute tool with the selected rows values.
- **Refresh:** Refreshes the screen.
- **Recache Services:** Causes the Oracle Utilities Network Management System services to recache with the new attributes you configured; otherwise, saved changes will not be recognized until Oracle Utilities Network Management System services are restarted.
- **Export Table…:** Displays the SQL needed to create the data displayed in this table.

Using the Add / Edit Attributes Dialog Box

The Add / Edit Attributes dialog box allows you to create or edit existing attributes. The dialog box has the following fields:

- The **Attribute** column defines the name of the SCADA measurement.
- The **Phase** column defines the phase associated with the SCADA measurement.
- The **Unganged** column defines whether this measurement should be treated as ganged or un-ganged by the alarm engine.
- The **Tag** column allows the alarm engine to group similar SCADA measurements together into parent and child alarms.
- The **Product** column is used to assign special meaning to a measurement. The following values are applicable:
- The **Active** column defines whether the attribute is active or not.

The following buttons are available:

- **Save Changes:** Saves the attribute and closed the dialog box.
- **Cancel Edit:** Cancels the action and closes the dialog box.

Using the Customer Administration Tab

The Customer Administration tab allows you to define a weighted priority for a customer. The weighted priority may be used for sorting events in the Work Agenda or viewed in the Event Details Trouble Info tab Customers view.

Menus and Toolbar

When the Customer Administration tab is active, the Configuration Assistant's **Actions** menu and toolbar change to provide functions for Customer Administration. The **Options** menu provides search methods.

Actions Menu

Menu Option	Description	Icon
Customer Search	Initiates a search when criteria has been added to the Searchable Information table in the Customer Weighted Priority Editor pane.	
Save	Saves information entered in the Customer Weighted Priority Editor.	
Reset to default	Used to reset a Customer weighted priority to the default value.	--
Clear Form	Clears all data from the Customer Weighted Priority Editor pane.	

Options Menu

Menu Option	Description
Set Wild Card Searching • Before • After • Both	Options for setting a wild card searches: Before, After, or Both. Note that you do not have to add a wild card character (*). **Example:** using the "After" wild card search. **Name**: *Mary S* returns: • Mary S Abbott • ... • Mary Szbrinski
Use Sound Search	Returns searches with "sounds like" matches. **Example:** Use Sound Search **Name**: *Fredric* returns: • Fredric • Fredrick • Frederick • Fred • Freda
Use Exact Match Search	Returns only exact matches.
Set Max Searching Results	Opens the Set Maximum Searching Result dialog box where you can set the limit for matches to return. The system will display a message when a search returns over 200 results, which is the maximum allowed by default.

Setting Debug

The Set Debug dialog box is initiated from the Help menu of all the NMS Environments. In some cases, issues cannot be properly diagnosed with only a list of actions the users partakes within the environment. In those cases, additional debug is required. The Set Debug dialog box should be used to turn debug categories on and off within an environment. When the dialog box is initiated from the Configuration Assistant user type, then additional options are available allowing the user to manage debug on all the clients and also within the Oracle Utilities Network Management System services.

Columns

- The **Name** column displays the name of the debug category. In some cases this is the fully qualified class name.
- The **On/Off Toggle** column displays and allows you to set whether the debug for that row is on or off.
- The **Level** column displays whether the debug is on or off.
- The **Application** column displays the application that the debug pertains to. If it is a generic debug category, then it will have an Application value of *All*. Other examples include, but are not limited to Web Switching, Authority, Call Entry, and so on.
- The **Destination** column displays where the debug setting will be set. For Java clients, the value will be Clients. Other values include, but are not limited to WebLogic, PFService, publisher, and so on.

  Note: This column is only visible if you are viewing the dialog box as a Configuration Assistant user. All other users will be limited to viewing debug pertaining to their client environment. Only a Configuration Assistant user can set debug levels on other clients, within WebLogic or within the Oracle Utilities Network Management System services.
- The **Description** column displays the documented description for the debug entry. Not all debug entries will have a description as some entries will be determined dynamically based on what the client has access to.

Manual Debug Entry

The Manual Debug Entry form is used to enter settings for debug that is not available in the table list or may require a level setting other than on or off.

Note: Only Oracle Utilities Network Management System services can accept debug number values greater than 1. Any value greater than 1 that is sent to a Java based destination will be viewed as an *on* request for the debug specified.

- The Name field allows you to enter a debug name that may not be available from the table list.
- The Destination field defines where the debug setting should be applied. If you have a custom adapter that has debug capabilities, then you can manually enter the registered name of this adapter in this field.

Note: This field is only visible if you are viewing the dialog box as a Configuration Assistant user. All other users will be limited to setting debug on their client environment.

- The **Level** field is used to define what level of debug you would like to define for the name that was entered. The field can take manual entries as well in case the list of levels do not include the debug level you wish to send to your specified Destination. If you are not a Configuration Assistant user, then the only levels you should use are on and off.
- The **Set** button sets the debug level within the current client environment or sends it to the Destination indicated if you are running this as the Configuration Assistant user.

The **Help...** button opens the online help window for this section.

The **OK** button closes the dialog box.

Using the Customer Administration Weighted Priority Editor

The Customer Weighted Priority Editor is divided into two panes: **Searchable Information** and **Additional Customer Information**. As the name suggests, the **Searchable Information** pane is used to search for and load customer information. Once the customer is found and selected, the **Additional Customer Information** is populated with current information and the **New Weighted Priority** field becomes editable.

Note: The Configuration Assistant Customer Administration search functions are much like Web Call Entry's search behavior.

Searching for a Customer

To set a weighted priority for a customer, perform the following steps:

1. Set your search option; see **Options Menu** on page 24-66 for more information on search options.
2. Enter Search Criteria. You can search for a customer based on any of the fields in the Searchable Information pane:
   - Account Number
   - Telephone Number
   - Name
   - Address
   - City
3. Press Enter (or click the search toolbar button).
   - If the search does not return a value, the system will return *"No customers matched your search criteria."* Click **OK** to dismiss the message.
   - If the search returns more than 200 records (or your defined Max Searching Results value), the system will return the *Too Many Customers Found* message, which will remind you of the option to set a higher maximum searching results. Click **OK** to dismiss the message. The Customer Selection dialog box opens listing the search results up to the maximum searching results value.

4. Select the customer to edit and click **OK**.

Editing a Customer Weighted Priority

Once you have selected a customer from the search results, the customer account information is loaded into the Customer Weighted Priority Editor. The **New Weighted Priority** field, which is at the bottom of the Additional Customer Information pane, is the only editable field.

1. Enter an integer value in the **New Weighted Priority** field. Notice that the **Save** button becomes enabled.

   Note: If you decide against editing the selected customer, click to reset the form.

2. Click .

Resetting Weighted Priority

If you need to set a customer's weighted priority back to its original value, perform the following steps:

1. Search for the customer to load their data into the Customer Weighted Priority Editor.
2. From the Actions menu, select **Reset to default**. The **New Weighted Priority** field will be populated with the customer's original weighted priority value.
3. Click .

Chapter 25

NMS Training Simulator: Trainer Environment

Oracle Utilities Network Management System Training Simulator is set of tools to help train users in control room Outage Management System / Distribution Management System (OMS/DMS) operations. Training may include:

- Prioritizing and managing outages.
- Assessing system load and taking corrective actions.

The Oracle Utilities Network Management System Training Simulator is useful for new hires, training on new releases, and for refresher training.

This chapter includes the following topics:

- NMS Training Simulator Overview
- Getting Started with the Trainer Environment
- Creating Training Scenarios
- Creating Training Scenarios
- Conducting Training Sessions
- Evaluating Trainee Performance

NMS Training Simulator Overview

The Web Workspace (**NTS**) provides a sandboxed Oracle Utilities Network Management System (NMS) environment that mimics common scenarios that occur in the production system. The **NTS** provides a *Trainer* environment via a new Trainer user type with special features that trainers may use to create a library of training scenarios for outages, overloads, and so on. These scenarios may be replayed during training sessions. Trainees log in to the **NTS** as a standard user type (**Understanding User Types** on page 1-2). Trainers are able to monitor trainees as they react to simulations complete with customer calls, AMI power-offs, wire-downs, device operations, SCADA updates, and other elements. The Trainer is an Administration user type, and they can change configuration options and system parameters.

Getting Started with the Trainer Environment

This section includes the following topics:

- Accessing the Training Simulator Environment
- Logging In as Trainer
- Creating Training Scenarios
- Conducting Training Sessions
- Evaluating Trainee Performance

Accessing the Training Simulator Environment

The **NTS** will typically be based on your particular **NMS** implementation. Consequently, your system administrator will need to provide the details for accessing your **NTS** environment. Trainers will log in to the **NTS** environment as a "Trainer" user type, which will provide an enhanced version of the Web Workspace for an Administration user environment with additional tools for developing training scenarios and administering training sessions. Trainees will log in to an **NTS** workspace as a user type that is applicable for the simulation, such as the Full Operations plus Web Switching user type. For trainees, it should mimic the configuration and roles they would see in production.

Logging In as Trainer

1. To log in, enter the following information in the Login window:

   User ID: enter the user name provided to you by your system administrator.

   Password: enter the password provided to you by your system administrator.

   Validate: click the **Validate** button to verify your login credentials.

   > **Note:** If your user name and password are not entered correctly, the system will display a "Login Error" message.

   Once you have entered your user name and password, the **Validate** button will become activated.

2. Click **Validate** (or press **Enter** while in the password field) to validate your credentials.

3. Select **Trainer** from the **User Type** drop-down list. The Web Workspace environment will launch with the extended trainer toolset. This includes the ability to bring up the Configuration Assistant directly from the Web Workspace **Tools** menu if modification of any rule settings is needed; see Chapter 24, Configuration Assistant, for more information on using the Configuration Assistant.

Creating Training Scenarios

The **NTS** allows trainers to create training scenarios in a *Training Scenario* sheet, which may be stored as templates to build up a training library. Trainers can record simulated device operations, customer calls, and other system events in the training scenario sheet.

Creating a Training Scenario Sheet

To create a Training Scenario sheet, do the following:

1. Select **New** and then **Switching Sheet...** from the Web Workspace **File** menu.
2. In the New Switching Sheet dialog box, select the **Training Scenario** type.
3. Click **Create**.

The new Training Scenario sheet will open.

Understanding the Training Scenario Sheet

The Training Scenario sheet is a specialized switching sheet type that contains only the fields and tabs necessary to record and conduct training scenarios.

Training Menu and Toolbar Options

Training Scenario actions are available through the **Training** menu, which is only visible with a Training Scenario sheet.

- **Play Scenario...:** plays each step in the scenario. See **Playing a Training Scenario** on page 25-9.
- **Play Scenario to Here...:** plays the scenario up to and including a selected step. See **Playing a Training Scenario** on page 25-9.
- **Pause Scenario:** pauses scenario execution. See **Pausing a Training Scenario** on page 25-9.
- **Reset Model...:** launches the Reset Model Confirmation dialog box that asks you to confirm that you want to reset the **NTS** back to the nominal state. See **Resetting the Model** on page 25-6.
- **Play Historical Dataset...:** allows you to open a recorded historical dataset. See **Replaying a Storm Scenario** on page 25-10 for more information.
- **Pause Historical Dataset:** allows you to pause playback of a historical dataset. See **Replaying a Storm Scenario** on page 25-10 for more information.
- **Resume Historical Dataset:** allows you to resume a paused playback of a historical dataset. See **Replaying a Storm Scenario** on page 25-10 for more information.
- **Cancel Historical Dataset:** allows you to cancel playback of a historical dataset. See **Replaying a Storm Scenario** on page 25-10 for more information.

Request Tab

The trainer can fill out the Request tab to describe the type of scenario and specify a default offset that will be used for playback of recorded steps.

The Request tab includes the following fields:

- **Owner:** allows the trainer to take ownership of the sheet.
- **Start Date:** beginning date and time when training scenario is played.
- **Finish Date:** date and time when training scenario is executed.
- **Default Offset:** the **Default Offset** field is an editable text field in the format that allows you to add a default wait period (hours:minutes:seconds) for the scenario steps.
- **Description of Scenario:** text field for adding information about the scenario.

Steps Tab

Each step in the steps tab has an editable Offset Time that allows the trainer to adjust the timing of the step execution during playback. The Offset Time is in the format of hours:minutes:seconds.

Recording Scenario Steps

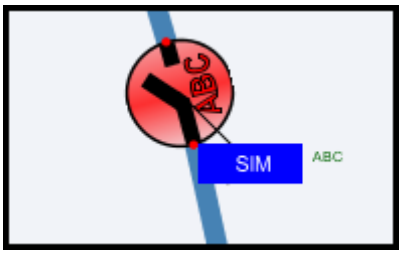
Once you have created a new Training Scenario sheet, you will be able to record actions that trainees will respond to during a training session. Scenarios may show operational situations such as customer calls coming in, predicted outages occurring, AMI last gasps received, repredictions occurring, SCADA devices operating, and other elements.

Using the Training Environment Control Tool

The Trainer Control Tool provides unique device operations and customer call simulation options.

Trainer Control Tool Options

- **Operate...**
  - **Simulate Open/Close**: Simulates an *Open* or *Close* operation. The simulated event is tagged in the Trainer environment, but not visible to trainees. The simulated operation impacts SCADA and Power Flow data as if it were an actual change to the network.



  - **Clear Simulated Operation**: clears the simulated open/close.
- **FLISR...**
  - **Create FLISR Event:** Creates a fault on the selected wire or cable segment that will trigger Fault Location, Isolation, and Service Restoration to run (if implemented and enabled).
- **Create FLA Fault:** Creates a fault on the selected wire or cable segment that will trigger Fault Location Analysis to run (if implemented and enabled).

- **Calls...**
  - **For customer transformers:**
    - **Submit Call…**
    - **Submit Calls…**
    - **Submit Power Out Calls for 20%**
    - **Simulate AMI Inputs…**
    - **Submit AMI Power-offs for 70%**.
  - **For upstream devices:**
    - **Submit Calls…**
    - **Submit Power Out Calls for 10%**
    - **Simulate AMI Inputs…**
    - **Submit AMI Power-offs for 30%**.

  The **Submit Calls…** and **Simulate AMI Inputs…** launch the Event Details Trouble Info tab **Customers** or **AMI Customers** pages, respectively, allowing you to create events for selected customers.

Submitting Customer Calls

The Trainer may add calls or AMI power off events to the scenario using the Control Tool in conjunction with Web Call Entry and Trouble Info.

Submitting a Singular Call

1. Select a device in the Viewer and launch the Control Tool.
2. Under the **Calls...** menu, select **Submit Call...** Web Call Entry will open and immediately display the Customer Selection window.
3. Select a customer row in the Customer Selection window.
4. Click OK. The selected customer data will load in Web Call Entry.
5. Click the **Submit Call** ( ) button. This action will submit a Power Out call for the selected customer.

Submitting Multiple Calls

1. Select a device in the Viewer and launch the Control Tool.
2. Under the **Calls...** menu, select **Submit Calls...** The Event Details Trouble Info tab opens with the Customers view displayed.
3. Select customer rows in the **Customers** table
4. Click the **Submit Call** ( ) button. This action will submit Power Out calls for each selected row.

Submitting AMI Power-off Commands

1. Select a device in the Viewer and launch the Control Tool.
2. Under the **Calls...** menu, select **Simulate AMI Inputs…** The Event Details Trouble Info tab opens with the AMI Customers view displayed.
3. Select customer rows in the **AMI Customers** table.

4. Click the **Submit AMI Power-off** ( ) button.

Submitting AMI Power-on Commands

1. Select a device in the Viewer and launch the Control Tool.
2. Under the **Calls...** menu, select **Simulate AMI Inputs…** The Event Details Trouble Info tab opens with the AMI Customers view displayed.
3. Select customer rows in the **AMI Customers** table.
4. Submit **AMI Power-on** ( ). The Work Agenda's # Power Ups column will update as the power ups are processed.

Adding Customer Calls with Web Call Entry

The Trainer may add calls to the scenario directly in Web Call Entry by selecting **Web Call Entry...** from the Workspace Tools menu. Each saved call is added as a step in the Training Scenario switching sheet.

> **Note:** The device field can be populated by selecting a device in the Viewer.

Simulating SCADA Input Changes Using the SCADA Summary

A Trainer may override the value of any SCADA input point by selecting the **Simulate SCADA Entry** option from the SCADA Summary **Actions** menu or from the right-click context menu. Each changed value is added as a step in the Training Scenario switching sheet and will cause the relevant digital or analog value to be overridden with the newly entered value as if it were an updated SCADA input. These updated values can be used to trigger alarms or FLISR in just the same way as an actual SCADA value change.

These overridden values will persist until the **Clear SCADA Entry** option is selected from the **Actions** menu.

Note that the value may not change back to its original value. Analog values that are calculated by the emulator will change back within a short time, but, for digital values, it is advisable to change the value back using the **Simulate SCADA Entry** option again.

All values will be returned to their original value when the **Reset Model** option is selected.

Resetting the Model

Once all steps have been added to the Training Scenario sheet, select **Reset Model...** from the **Training** menu to return the to the nominal state. The system will present a dialog box asking you to confirm the action and warn of the actions taken in the Reset Model operation.

Reset Model Actions

- Completes all events; the other users do not get the opportunity to save any unsaved work.
- Closes all open sheets and safety documents for the trainer user except for templates and training scenarios; local changes to closed sheets are not saved.

- Changes all safety documents and sheets except for templates and training scenarios to the *Training-Completed* state.
- Cancels all pending momentary operations and expected actions.
- Closes all study sessions.
- Resets all delegated zones.
- Removes all tags and conditions.
- Resets all digital and analog measurements.
- Resets all commissioning/decommissioning to nominal.
- Resets all devices to their nominal state.
- Releases all crews.
- Cancels all active or incomplete events.
- Rolls back all model edits.

Click **Yes** to confirm that you want to reset the model. When the model has reset, the system will present the Reset Model Finished dialog box; click **OK** to close the dialog box.

Saving the Training Scenario Sheet

Once you have recorded the training scenario, you may save and close the sheet. The saved sheet can then be copied and used as a template for subsequent training sessions.

Recording a Storm

Administrators can capture storm calls and SCADA operations using the RecordStorm program on the command line.

The RecordStorm program accepts the following options:

```
RecordStorm -file [file name]
            [-start_date [[start date and time]]]
            [-end_date [[end date and time]]]
            [-operations]
            [-all_operations]
            [-ami]
```

where

- **-file:** Required. The file to record. These files will reside in the `$NMS_DATA_FILES` directory with an `.scen` extension, if not already specified
- **-start_date:** The begin date/time of the storm (`mm/dd/yyyy hh:mm`).
- **-end_date:** The end date/time of the storm (`mm/dd/yyyy hh:mm`).
- **-operations:** Whether to save SCADA device operations with the calls.
- **-all_operations:** Whether to save all device operations with calls.
- **-ami:** Whether to save AMI as well as customer calls.

Note: All date and time combinations need to be quoted.

Example: Record Historical Calls from October 29, 2012

To record historical calls in a file called **test.scen**, run the following command:

```
RecordStorm -start_date "10/29/2012 00:00" -end_date "10/30/2012
00:00" -operations -ami -file test
```

The `test.scen` file will be recorded in the `$NMS_DATA_FILES` directory.

Conducting Training Sessions

When conducting a training session, the trainer will log in as a Trainer user type and the trainees will log in as standard operations user types. Although it is possible to record a training scenario during a training session, the trainer will typically create a new training scenario sheet from a previously developed training scenario sheet. This allows the trainer to focus on the trainee's actions.

Running a Training Scenario

Starting a Training Scenario

The trainer begins a training session by creating a new training scenario sheet from an existing training scenario sheet.

1. Select **Open** and then **Switching Sheet...** from the Web Workspace **File** menu.
2. Select a Training Scenario from the Open Switching Sheet dialog box.
3. Select **Copy As...** from the Training Scenario's **File** menu.
4. Select **Training Scenario** in the Switching Sheet Types table and click **Create a Copy**. The trainer can then complete information in the **Request** tab about the training session prior to playing the training scenario.

Playing a Training Scenario

Scenarios may be played from start to finish or to a selected step.

- When you wish to play the scenario to a certain point, do the following:

1. Select the row where you wish to complete and then pause.
2. Click the **Play Scenario to Here** ( ) button. The **NTS** will present a dialog box asking if you wish to override the default offset to add time to each step.

- When you wish to play the entire scenario, do the following:

1. Click the **Play Scenario** ( ) button. The **NTS** will present a dialog box asking if you wish to override the default offset to add time to each step.

In either play scenario, the steps will proceed and the synchronized training environment will change according to the steps.

Pausing a Training Scenario

At any point when running a scenario, you may pause the steps by selecting **Pause Scenario** from the **Training** menu or clicking the pause ( ) button. This allows flexibility to take breaks or discuss the training steps.

Replaying a Storm Scenario

To replay a recorded storm, you must first create a new training sheet (see **Creating a Training Scenario Sheet** on page 25-3). With the new training sheet open, choose **Play Historical Dataset...** from the **Training** menu and then select a prerecorded storm scenario in the Play Dataset dialog box.

> **Note:** See **Recording a Storm** on page 25-8 for information on creating storm scenarios.

By default, data from the recorded storm is received at the same rate that the data was received during the event, to increase or decrease the playback rate, change the Play Dataset dialog box **Playback Interval Multiplier** value.

- To increase the rate, select a multiplier value greater than one.
- To decrease the rate, select a value less than one.

> **Note:** The dialog box will list all `*.scen` files found in the `$NMS_DATA_FILES` directory; if no scenarios are found, the system will return a "No Scenarios Available" error.

To pause, resume, or stop the storm scenario, select **Pause Historical Dataset**, **Resume Historical Dataset**, or **Cancel Historical Dataset**, respectively, in the **Training** menu.

> **Notes:**
>
> - The Resume Historical Dataset function is only available during the current session so, if you log out, you would need to replay the historical dataset from the beginning.
> - While replaying storms requires the training sheet be open, this process does not create steps or in anyway amend the Training Scenario sheet.

Evaluating Trainee Performance

The trainer can evaluate trainee performance using the **NTS** enhanced User Log. The User Log allows the trainer to view trainee logs as well as open the trainee's switching sheets.

1. Select **User Log...** from the Web Workspace **Tools** menu.
2. Enter the trainee name in the **User ID** field.
3. Select **Load User Log** from the **Actions** menu. All of the actions taken by the trainee will be displayed in the User Log table.
4. To view the trainee's switching sheets, select **User's Switching Sheets...** from the **Actions** menu. The Open Switching Sheet dialog box will open listing any switching sheets. Enter the user name in the table header to filter the list. Select a sheet in the table and click **Open**. The sheet will open in the Web Workspace.

Chapter 26

Operations Mobile Application

The Oracle Utilities Network Management System Operations Mobile Application (OMA) provides the crews with the ability to coordinate their assigned tasks with the Network Management Systems operators, transition their tasks from assigned to completion, and to create and update damage assessment reports while in the field using mobile devices.

OMA Progressive Web App

Client PWA Installation Instructions

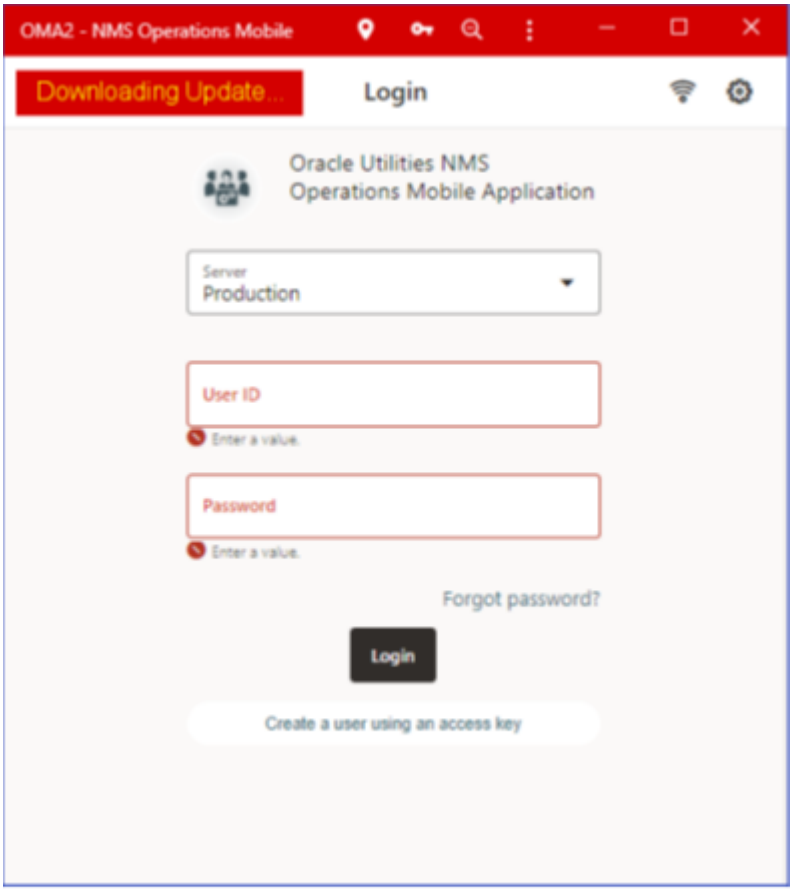
OMA is a PWA application and can be installed on the following types of systems:

Platform	Supported Browsers
Windows 10 and above	Google Chrome Microsoft Edge
Linux	Google Chrome
Android tablets and phones	Google Chrome
iPad and iPhone	Safari

OMA installation is done by using the devices browser and connecting to the OMA application website.

OMA has a standardized installation process for Windows, Linux, iOS, and Android:

1. Launch the browser to the https server where OMA is installed (for example, `https://host.com:8889/mobile/oma2/www/index.html`).
2. On launch, the browser will detect the app is a PWA and will start the download of the PWA to the browser cache storage. A flashing text message ("Downloading Update...") will appear in the OMA header bar:



3. On iOS devices, while the PWA is downloading, a dialog box will display instructions for adding the application to your home screen. Once the down is complete, tap Safari's action icon (⎙) and then tap **Add to Home Screen** (+). The app icon will be on your home screen. Click the icon to start OMA.

   On non-iOS devices, once the PWA download is complete, an **Install as PWA** button will replace the flashing "**Downloading Update...**" text. Click the **Install as PWA** button.

   - **On Windows with Chrome:**
     - You will be presented with an installation dialog box. Click the **Install** button to install it on the device.
     - The PWA will close in the browser tab and open as a standalone PWA app.
     - The PWA will be given a start menu option from where you can launch the app, pin it to the taskbar, pin it to the start, or open the location of the app and copy it to the desktop.
   - **On Windows with Microsoft Edge:**
     - You will be presented with an installation dialog box. Click the **Install** button to install it on the device.
     - The PWA will close in the browser tab and open as a standalone PWA app.
     - You will be presented with a dialog box

- **On Android Chrome:**
  - You will be presented with an installation dialog box. Click the **Install** button to install it on the device.
  - A small temporary message will indicate the app is being added to the home screen.
  - Close the browser and the home screen should be focused on the location of the OMA app icon. You may drag it to any location on the home screen(s).
  - To launch OMA as a PWA, click the OMA launch icon.
- **On Linux Chrome:**
  - You will be presented with an installation dialog box. Click the **Install** button to install it on the device.
  - The PWA will close in the browser tab and open as a standalone PWA app.
  - The PWA will be given a start menu option, most of the time under a section identified as Chrome Apps. From there, you most likely will be able to drag it to the desktop.
  - To launch OMA as a PWA, just click on the OMA launch icon.

Client PWA Update Instructions

If the client is connected to the network, then, on application start up, it will look for a newer version of the PWA application on the HTTPS server. If it finds one, it will start the download and indicate to you that an update is being downloaded with a flashing notice on the application header (like when it was initially installed).

While downloading the update, you may continue to use the application. Once complete, the download notification (in the header) will be replaced with a notice that you can click to install the update. You may continue to use the application; the application will not be updated until you restart or click the install update button.

Client PWA Uninstall Instructions

To uninstall the PWA application if different based on the platform the application was installed from.

Windows - Edge

There are a couple of ways to uninstall the PWA app:

1. From the Windows **Start** menu, open the **Settings** app.
2. Select **Apps** and it will open the **Apps & features** page. Scroll down, find the **OMA2** app, select it, and click **Uninstall**.

Or

1. Open the Edge browser.
2. Go to edge://apps.
3. Scroll down to find OMA2.
4. Select **Details**.
5. Click **Uninstall**.

Windows and Linux - Chrome

1. Bring up Chrome and go to **Chrome://apps**.
2. Right-click the OMA app and select **Remove from Chrome**.

Android

1. From your app drawer or home screen, open **Settings**.
2. Tap **Apps & Notifications** See all apps.
3. Find the PWA you want to remove and tap the icon.
4. Tap **Uninstall**.

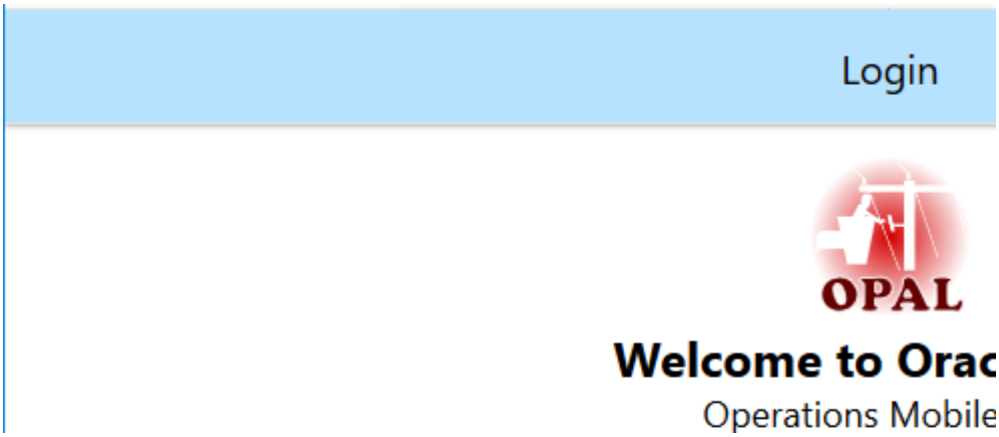
iOS

PWAs can be deleted the same way any native app is removed.

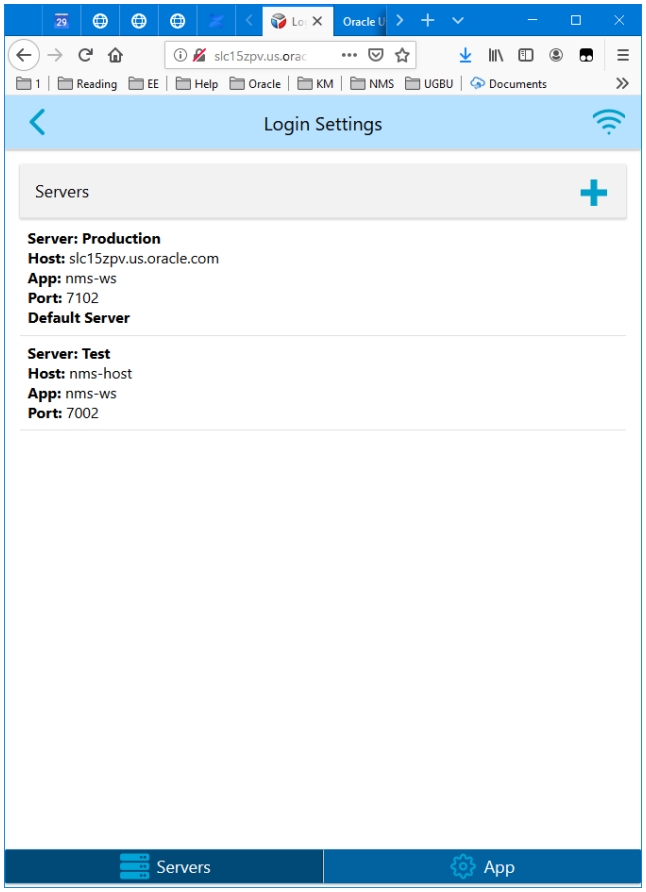
1. From the Home screen, tap and hold until the icons start jiggling.
2. Select the "**x**" in the top-left corner of the OMA icon.
3. Lastly, confirm the operation by tapping the **Delete** button.

Configuring OMA Login Settings

You may need to enter some information about your connection in OMA prior to use. To open Login Settings page from the Login page, tap the gear button in the upper right corner of the page.



The **Login Settings** page will appear and it contains two main tabs on the bottom of the page.



- **Servers Tab** to add, edit, or modify NMS servers you wish to be connected to.
- **App Tab** containing settings about the general application and login options.

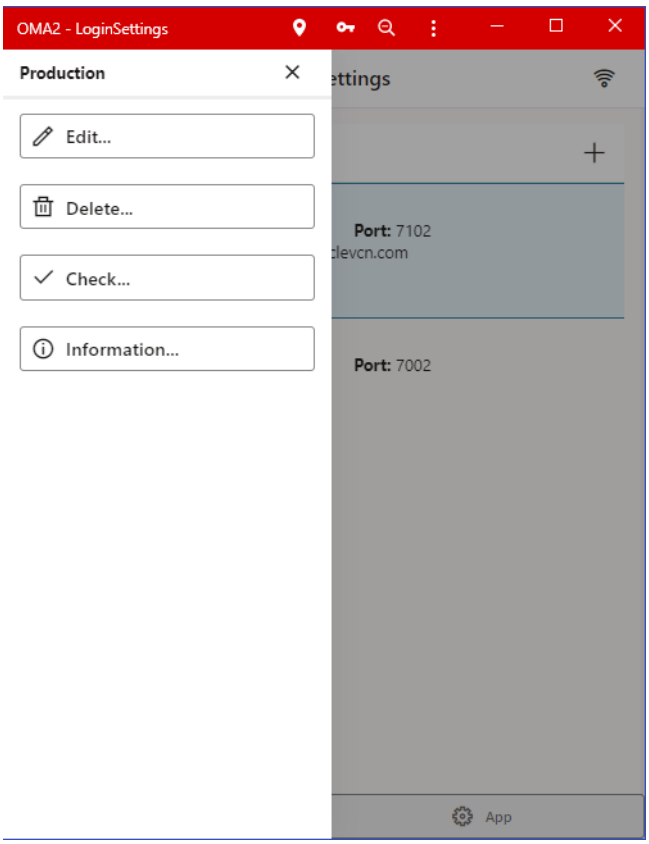
Login Settings Servers Tab

From the Login Setting Servers tab, you can add, modify, or delete servers that you would like OMA to connect to. To add a server, tap the plus sign button ( ) to open the Server Configuration pane. On the Server Configuration panel, complete the server information.

1. **Server Name:** Enter a name for the server. This can be any name that is meaningful to you.
2. **Host Name:** Provide the server URL or IP address.
3. **Server Application Path:** The path on the server to the web service that the application connects to (typically nms-ws).
4. **Server Port:** The server https port that allows you to access the OMA RESTful services.
5. **Validate on NMS-WS in addition to NMS Check Box:** If LDAP/AD authentication is enabled for OMA, when selected, will attempt to authenticate log ins on nms-ws WebLogic authentication scheme server first, and then the NMS WebLogic server second. When unchecked, the nms-ws WebLogic authentication scheme is not used and only the NMS WebLogic authentication scheme is used.
6. **Default Check Box:** Allows you to set this server as your default when OMA launches.
7. **Action Buttons:**
    - **Check Mark ():** Tap to test the server configuration that you have entered.
    - **Information ( ):** Tap to get an information panel with details on the application, the application server, and the mobile server.
    - **Delete ( ):** Tap to remove the server from the list of servers.

Once you've entered the server information, tap the **Save** button ( ) to save the server setting.

From the Login Settings Servers page, once you have servers defined, you can select one of the server cards and a set of icons will appear on the bottom of the server card:



- The pencil button ( ) will open the editor for the selected server card and allows you to change information about the server connection.
- The trash can button ( ) will delete the server from the OMA server configuration.
- The check mark button ( ) will test the server configuration and let you know if the server is reachable.
- The information button ( ) will get detailed information about the application, the application server, and the mobile server.

Login Settings App Tab

The **App** tab allows you to set up certain setting that may be available to you.

- **User Interface Scaling:** Based on the type of device you are using, you will be able to adjust the OMA user interface scale to better fit your device (such as a phone verses tablet). This section will either provide instructions about how to scale the application or will provide an area to set the user interface scale.

  If you are on an Android or iOS device, on initial launch of the application after installation, OMA will detect the size and resolution of the device and will automatically set this value. Once set by OMA, you can override the automatic value and it will remain at your specified value for future launches of the application. If you would like to return to the OMA determined scale, set this value to `99.99`, and when you return to the login screen, OMA will set it again. Large screen devices will most likely get this value auto-set to scale value of 100.

- **Enable Extended Debug Logging:** This check box, when selected, will set OMA to create debug logs that may be used when reporting issues to the application support team.

- **Allow Server Selection on Home Screen:** This option enables the drop-down list of servers that you may connect to. If not enabled, only the default server will be displayed on the login screen.

- **All Jail Broken or Rooted Device to Run OMA:** Jail-broken or rooted devices are normally not allowed to run OMA, but this may be enabled for development and testing because emulators would otherwise be disallowed. This option may be removed from OMA by your project team so production users would not be able to change it.

- **Enable IDCS Login:** This check box, when selected, allows the use of the Oracle Identity Cloud Service (IDCS) login. This will be applicable in a future release of OMA when it supports IDCS logins.

- **OMAHttpBridge URL - request:** Specifies the RESTful service URL to request any messages from third party applications to be processed.

- **OMAHttpBridge URL - notloggedin:** Specifies the RESTful service URL to inform third pary applications that the OMA user is not logged in.

- **GPS Polling Interval (Zero to Disable):** Sets the interval in seconds when OMA should check the device GPS coordinates.

Logging In

How to Log In as an Existing User

If you are an existing OMA user, enter your user name and password and tap **Login**. If your user name is an LDAP/DA user, you will be authenticated against the LDAP/DA server. If this is the first time you have logged in to the system, you will be taken to the Profile page where you can specify your information.

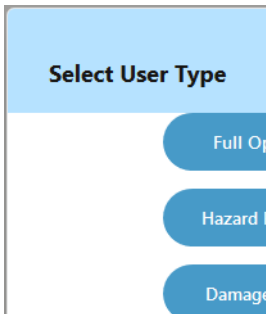
If your user name and password are invalid, a message will appear asking you to try again.

How to Log In as a New User

To login as a new user, your system administrator must provide you with a new user key. Tap the **Have your user account key? Sign Up** link and the page will update to include a field to enter the new user key along with your user name and password. Once logged in, you will be taken to the **Profile** page where you can specify your information. Subsequent logins can be done on the normal login page for existing users.

Understanding and Selecting Your User Types

If you are authorized for just one OMA user type, after login, you will be taken directly to the OMA main display for your user type. If you are authorized for multiple user types, you will be presented with a list of user types and you will need to choose one in order to complete the log in process.



The following user types are included in the OMA template:

- Full Operations
- Hazard Responder
- Damage Assessor
- View Only

Most of this chapter will refer to the **Full Operations** user type. The other user types are summarized in **Understanding User Types** on page 26-46.

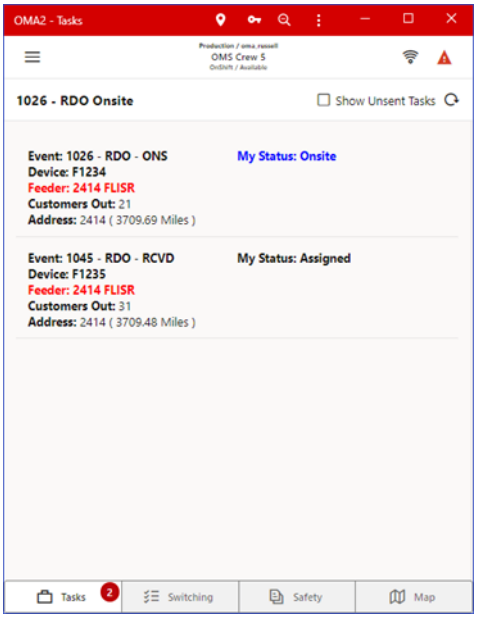
Understanding the Main Page - Full Operations User Type

The primary page for performing work is made up of four tabs, which are described in the following sections:

- Understanding the Tasks Tab
- Understanding the Switching Tab - Full Operations User Type
- Understanding the Safety Tab - Full Operations User Type
- Understanding the Map Tab - Full Operations User Type

Understanding the Tasks Tab

The **Tasks** tab provides a listing of any events that you are assigned to. The general event details are listed in a row that expands to reveal available actions when selected.



The **Show Unsent Tasks** check box will allow you to show or hide tasks that have been assigned to your crew but not sent to your device. This is possible if NMS has the Two-Step Crew Assignment rule enabled.

Tap on a task to display a list of relevant actions.

Depending on the state of your task (for example, **Assigned**, **En Route**, **Onsite**), you may have the following options.

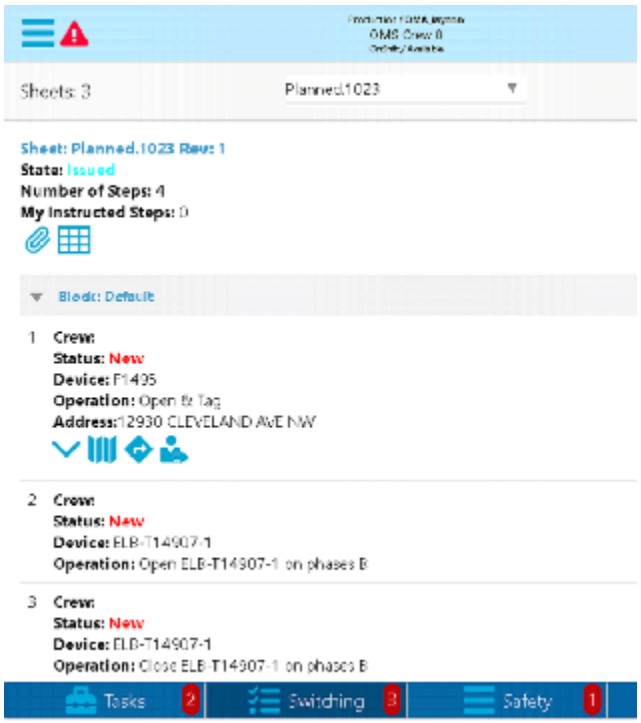
- A **Show in Map** icon ( ), when tapped, will open the map panel and focus the map on the task.
- A **Get Directions** icon ( ), when tapped, will open the devices native navigation app to assist you in driving to the task location.
- An **En Route** icon( ), when tapped, will flag that you are en route to the event.

- An **On Site** icon ( ), when tapped, will flag that you are on site for the event.
- An **Assign or Suspend** icon ( ), when tapped, will change your status back to **Assigned** or **Suspended** for the event.
- A **Reject Task** icon ( ), when tapped, will remove the task from your list of Tasks.
- A **Read** icon ( ), when tapped, will transition the event to the Crew Read (CRD) state.
- A **Send to Crew** icon ( ), when tapped, will send the event to your crew.
- An **Event Info** icon ( ), when tapped, will open the Event Info page and allow you to review and update the event. See **Understanding the Event Details Page - Full Operations User Type** on page 26-26 for more information.
- A **Damage Reports** icon ( ), when tapped, will open a new panel with a list of damage reports associated with the event and allow you to open them.
- A **Work Queue** icon ( ), when tapped, will open Select Work Queues dialog box, which allows you to assign the task to the selected work queues. You may also enter an optional comment.
- A **Real Outage** icon ( ), when tapped, will confirm the probable outage as a real outage and will open the device in the model.
- A **Confirm Outages** icon ( ), when tapped, will open a panel with a list of customers associated with the outage and allow you to mark them as confirmed service outages or confirmed secondary outages.
- A **More** selection icon (•••) allows you to create a switching sheet as a copy of an existing template sheet identified by a **Template ID** (see **Understanding the Template ID Field** on page 11-19).

  Note: The switching sheet copy options are configuration dependent and based on the templates saved by an **Administration** user.

Understanding the Switching Tab - Full Operations User Type

The Switching tab provides a drop-down list that allows you to select from any switching sheets that are assigned to the crew. The pane below the drop-down list displays the switching sheet name, its state (New, Issued, instructed, and so on), and the number of instructed steps. The **Switching** tab also includes a number of sheets in the upper left-hand corner. This same number can be found on the **Switching** tab.



Buttons

- The **Switch Sheet Report** icon ( ), when tapped, will bring up the Switching Sheet Report Options panel, allowing you to select the content of the Switching Sheet report to generate and to initiate the report generation. After the server generates the report, it will be brought up in the device's native PDF file viewing application.
- The **Attachments** icon ( ), when tapped, will bring up the Switching Sheet Attachments panel. It will display any existing switching sheet attachments, which you may open and view with a device application. You also may add attachments using the following options.

- A **camera** icon (), when tapped, will bring up the device camera application and allow you to take a photo and attach it to the switching sheet.
- A **Search** icon (), when tapped, will bring up a file selection panel and allow you to attach a file.

- The **Complete Switching Sheet** icon () will appear if you have permission to complete switching sheets and all the steps of the switching sheet are in a terminal state.

Steps

The steps are grouped within a block step that can be expanded or collapsed by clicking the icons displayed to the far left of the block row's name.

When shown, each step will have a step number to the far left along with the following fields:

- The **Crew** field displays all of the crews that are currently assigned to this step.
- The **Status** field displays the current state of the step. This includes, but is not limited to New, Instructed, and Completed. For a full list of step states, see **Switching Sheet States** on page 11-5.
- The **Device** field displays the device alias referenced in the step.
- The **Operation** displays the description of the switching action. When the switching action is associated to a safety document, then the safety document type and number will be displayed in this field after the switching description.
- The **Address** displays the address of the device referenced in this step. This field is only visible when the switching step card is selected. To the right of the address is an address edit icon (), that, when tapped, will bring up an **Enter or Change Step Address** panel that allows you to change the address. This icon will only be visible if your crew has been assigned to the step.
- The **External ID** displays the external id (if one exists) of the tag referenced in the step. To the right of the **External ID** field, is an edit icon (), that, when tapped, will bring up an **Enter or Change Step External ID** panel that allows you to edit the ID. The icon is visible only if your crew has been assigned to the step. You cannot edit the ID if the step is completed.

When the switching step card is selected, a set of available icons will be shown for that step. Not all the icons will be shown at the same time and some will be dependent on the state of the step. Below is the list of available icons.

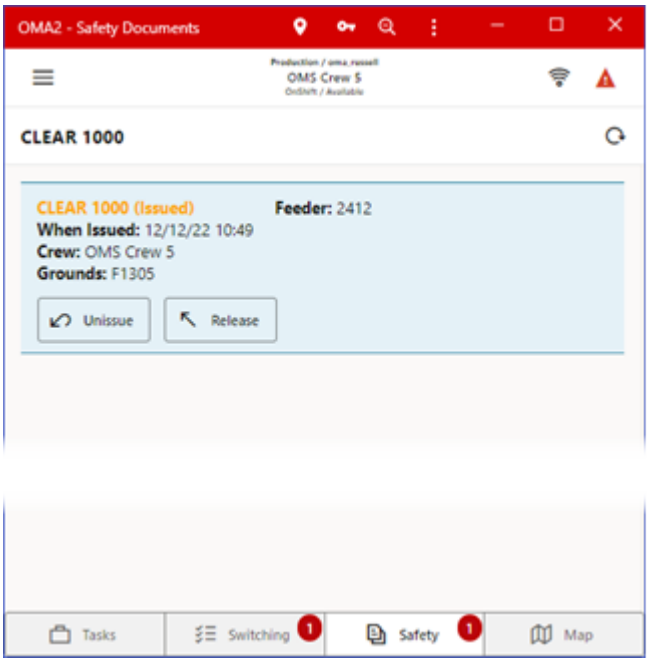
- The Show/Hide Child Steps icons (,) expand or collapse additional switching step cards pertaining to an aggregate step. These icons will only be shown when an aggregate step is highlighted. Note: The child steps cannot be individually selected, instructed or executed and are only there for display purposes.
- The map icon (), when tapped will take you to the OMA map panel and center the map on the step's location.

- The navigation icon ( ), when tapped will open the device's native navigation application to assist you in driving to the switching step's location.
- Users with permission to self-instruct switching steps will see a self-assign icon ( ) for steps that have not been instructed or assigned to a different crew. When selected, it will instruct the step.
- If a step is in the New or Uninstructed state, a Ready for Instruct icon ( ) will appear and allow the OMA user to notify the NMS operator they are ready to be instructed. This will appear on the NMS Switching Step row. If the step already has been marked as Ready for Instruct, a Not Ready for Instruct icon ( ) will appear and allow the OMA user to clear a previous notification of ready for instruct.
- If the step has been instructed to be complete, three extra icons will be shown:
  - A Step Complete icon ( ).
  - A Step Abort icon ( ).
  - A Step Fail icon ( ).
- For steps that have been instructed, you will see an un-instruct icon ( ) that allows you to un-instruct the step.

When any of the step state transition icons are tapped, an Enter or Change Step Information panel will appear and allow you to enter updated step Details, Date/Time or Comments. After clicking the save icon ( ) on the Enter or Change Step Information panel, the server will be notified and if applicable, the step's operation will be applied to the NMS model. The step data entered and the state of the step will be broadcast to any NMS users that may be monitoring the switching steps at that time.

Understanding the Safety Tab - Full Operations User Type

The Safety tab displays a list of Safety documents assigned to your crew. Each assigned Safety document, when selected, will provide options specific to the type and state of the Safety document.



You have the option to view the Safety document and execute the steps to place it. You may also unissue the Safety document or release it.

- The **Unissue** icon (↶) is used to place an issued safety document into an Unissued state to be updated.
- The **Release** icon (↖) releases an issued safety document so it may be assigned to another crew.

Understanding the Map Tab - Full Operations User Type

The Map enables you to view and interact with a real-time view of the electrical network. It provides additional situational awareness as you record device operations, confirm switching steps, work with damage assessments, and so forth.

Navigating the Map

There are several tools and user interactions that enable you to navigate the Map.

Panning and Zooming

- On touch enabled devices, move your finger across the Map to pan the map. Use the pinch gesture to zoom in or out.
- On mouse-enabled devices, click and hold the left mouse button to pan - use the mouse wheel to zoom in and out.

Back and Forward Buttons

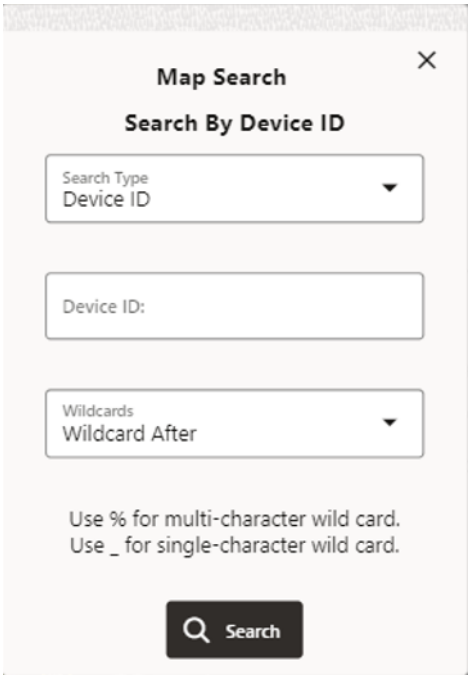
Tap the **Back** ( ) and **Forward** ( ) icons to quickly navigate to previously viewed parts of the network.

Track

Tap the **Track** button ( ) to focus the Map on your current GPS location.

Map Search

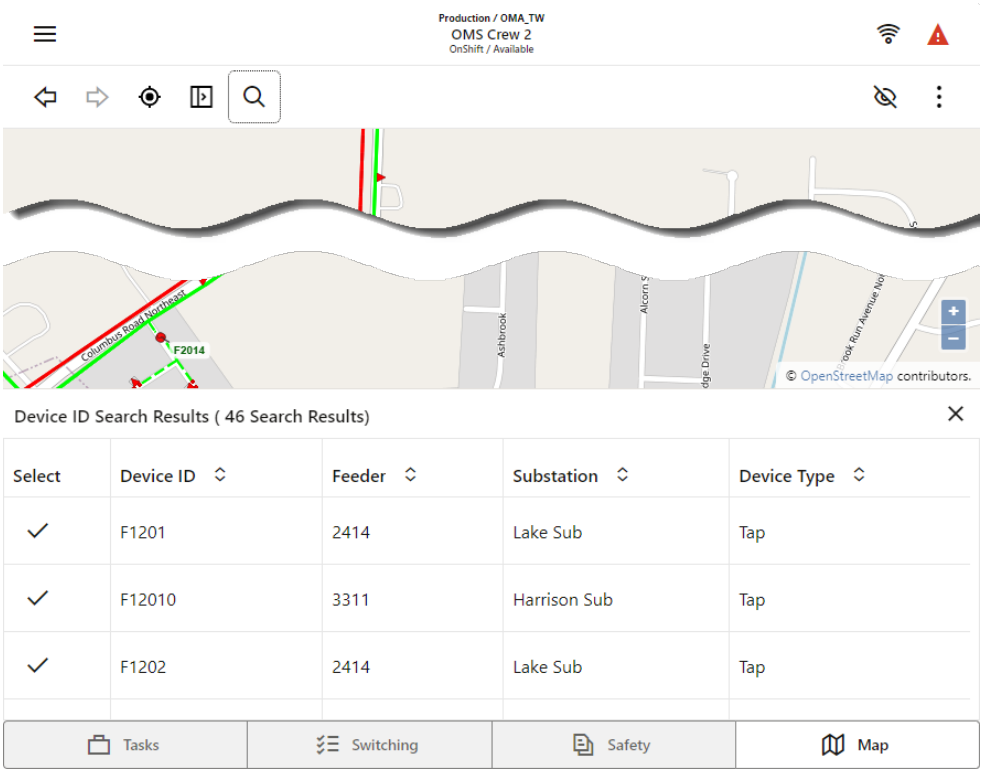
Tap the **Search** icon ( ) to search for devices, locations or other network objects



Based on your configuration, the **Search Type** drop-down list allows you to select the type of information to search for (such as **Device ID**, **Customer Name**, **Account ID**, and so on).

Note: The selected search type will populate the **Search By** title dialog box (for example, **Search By Device ID** in the screen capture above).

You may use a wild card search when you aren't sure of the value to searchon. For example, in the NMS OPAL model, searching for F12% with **Wildcard After** selected, will return a **Device ID Search Results** panel with multiple potential matches.



With the Search Results panel displayed, you may:

- Tap a row to focus on the device.
- Tap the check mark selection icon (✓) to set the map focus on the search item and close the search results panel.

Showing and Hiding Layers of Information

Tap to display the Hide/Display panel. Options here show and hide different layers of information.

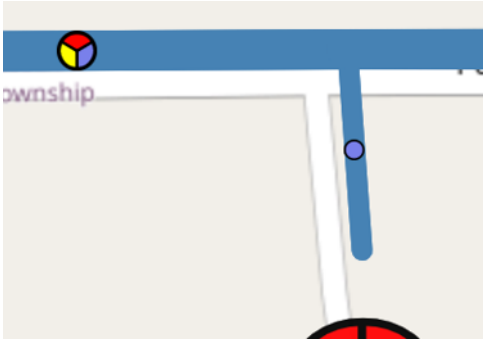
Hide/Display

- **Landbase:** Toggle the visibility of the Landbase (if one is selected in the Settings panel)
- **Secondary:** Toggles the visibility of the Secondary network.
- **Structures:** Toggles the visibility of structures such as poles
- **Non-Main Asset DA:** Toggles the visibility of non-main asset damage report symbols.

- **Customer Calls:** Toggles the visibility of the customer call locations.

Annotations

- **Conductor Current Phase Markers:** Toggles the visibility of phase indicators on conductors.



- **Device Labels:** Toggles the visibility of device labels
- **Device Nominal Phase Labels:** Toggles the visibility of devices' nominal phase(s). If a device is in an abnormal state the background of the label is colored green (abnormally open) or red (abnormally closed).
- **Conductor Nominal Phase Labels:** Toggles the visibility of conductors' nominal phase(s). If a conductor is in an abnormal state the background of the label is colored green (abnormally de-energized) or red (abnormally energized).
- **Conductor Feeder Labels:** Toggles the visibility of conductor feeder labels.
- **Flow Direction:** Toggles the visibility of flow direction arrows.

Crew Types

- All
- Line
- Trouble
- Guide
- Service
- Eval
- Tree Crew

Conductor Highlight

- Assessed
- Predicted De-Energized
- Confirmed De-Energized
- Confirmed Degraded

Using the Options and Settings Menu

Tap (⋮) to access Map Options and Settings menu.

Settings

Tap the gear icon (⚙) to display the **Settings** panel. Options here enable you change visualization and behavior of the Map. Note that the Map updates as you adjust them:

- **Landbase Source:** Enables you to select different landbases, including an offline landbase.
- **Landbase Opacity:** Select the visual intensity of the landbase.
- **Show Offline Landbase when Offline:** Automatically switches to the downloaded offline landbase when you are offline. When you reconnect your selected online landbase will be automatically restored.
- **Map Theme:** The Map theme can be changed to support low-lit or well-lit working environments. The following options are available:
  - **Automatic (Follow Theme):** Inherits the Light or Dark theme selected in the main OMA Setting dialog.
  - **Dark:** Displays the dark Map theme regardless of the currently applied theme.
  - **Light:** Displays the light Map theme regardless of the currently applied theme
- **Symbol Scale:** Select the preferred symbol size/scale (applies to devices and symbols)
- **Big Symbols:** When selected displays preconfigured symbols larger when zoomed out.
- **Big Symbol Scale:** Select the scale of big symbols, when they are displayed.
- **Line Scale:** Select the thickness of conductors.
- **Text Scale:** Select the size of text displayed in labels
- **Condition Distance Scale:** Select the distance at which conditions and outage symbols display from their associated device.
- **Conductor Highlight Blur:** Display conductor highlighting with sharp edges, or with blurred edges.
- **Conductor Highlight Opacity:** Select the intensity/opacity of the highlighting.
- **Conductor Highlighting Scale:** Select the thickness of conductor highlighting.
- **Trace Outline Opacity:** Select the intensity/opacity of traces.
- **Trace Outline Scale:** Select the thickness of traces.
- **Feeder Highlight Opacity:** Select the opacity/intensity of non-selected feeders, when Feeder Highlighting is applied.
- **Conductor Dashing Mode:** Conductor line styles can be applied to indicate phasing or overhead/underground
  - **Underground Cables:** Display underground conductors with dashed lines.
  - **Phase Count Dashes:** Display number of phases as dashes.

    - **None:** Do not display underground cable dashing or phase count dashes.
- **Rotate Device Symbols:** Display device symbols in the same orientation or aligned with the network.
- **Device Labels Always to the Right:** When selected, displays device labels to the right of the device.
- **Do Not Move Map When Panels Open:** When selected, as Map panels are displayed the Map does not move to accommodate the panel.
- **Inertial Panning:** When selected, the Map exhibits "momentum" after panning with the mouse or finger.
- **Smoothly Animate Between Positions:** When selected, the Map smoothly pans and zooms between different positions; for example when clicking Back or Forward, when targeting on nearby events, or displaying the extent of a trace.
- **Auto-reset to Default Selection Mode:** When selected, returns to the default Map selection mode automatically after using one of the alternate selection modes or when performing a measure distance operation. If this is not selected, then the map will remain in the selected mode (for example, geographic location selection or measure distance mode) until you choose a different mode.

After changing settings in this panel, click OK to apply the changes, or click Defaults to restore the factory settings.

The changes you apply here will be saved on your device.

Map Updates
Checks for available map updates and allows you to download them.

View
Options available here provide different views of the electrical network:

- **Color by Feeder:** When selected, colors the network feeder by feeder.
- **Color by Phase:** When selected, colors the network by phase.
- **Color by Nominal Voltage:** When selected, colors the network by nominal voltage.
- **Color Secondary by Fixed Color:** When selected, all secondary network will show with the configured fixed secondary color.
- **Color Secondary by State:** When selected, secondary networks that have state related styles will be styled according to the state. Any secondary network that is in a nominal state will show the configured fixed secondary color.
- **Color Secondary by State and Mode:** Similar to the **Color Secondary by State** option, but the nominal state conductors will follow the Feeder/Phase/Voltage coloring mode, just like non-secondary conductors.
- **Show Nominal Network State:** When selected, displays the nominal state of devices and conductors.
- **Declutter Symbols:** When selected, declutters the network when zoomed out.
- **Map Color Legend:** Displays the Map Color Legend dialog, which illustrates the colors, highlights, and line styles for the different electrical states, phases, and voltages.

Selection Options

Options here provide different ways of accessing and selecting objects on the Map.

- **Open / Close the Selection Panel:** When selected, the Selection Panel will slide out each time an object is selected in the Map.
- **Select Map Location:** Enables you to tap on a location on the Map, and display its geographic co-ordinates.
- **Single Touch Action:** Select map objects with single touch action
- **Circle Action:** Select map objects with circle action
- **Box Action:** Select map object with box action
- **Polygon Action:** Select map object with polygon action
- **Measure Distance:** You can measure distances on the Map
  - Tap on the map to add a start position.
  - Move to a different position and tap again to create a turning point. Repeat as necessary.
  - Tap on the last point to complete the measurement. The distance is displayed in the top-right corner of the Map.
  - Tap anywhere in the Map to remove the measurement.
- **Clear Selection and Action:** Clears the selected objects from the **Selection List** panel and the map.

GPS Location

Options here provide access to location and tracking information:

- **Track Current Location:** Tracks your current location on the Map
- **GPS Location:** Provides options to focus the Map on your desired location.
- **Goto GPS Location:** Focuses the Map on your GPS location.
- **Select Map Location:** Focuses the Map on a selected location.
- **Directions to Location:** Opens the device's native navigation app to assist you in driving to the task location.
- **Add Damage Report for Location:** Allows you to create a damage report at the selected location.

Navigation

- Show Map Search: Displays the Map Search dialog
- Find Assessments: Lists all of your active patrol assessment conditions. From the Assessment panel, you can select an assessment condition and the Map will focus on the condition.
- Back: Navigate back to the previously viewed Map position Forward: Navigate forward to a previously viewed Map position.

Understanding the Selection and Traces Panel

The Selection and Traces panel is displayed when you select one or more objects on the Map, or tap Selection Panel icon.

The panel has 2 tabs – **Selection** and **Trace**.

Selection Panel

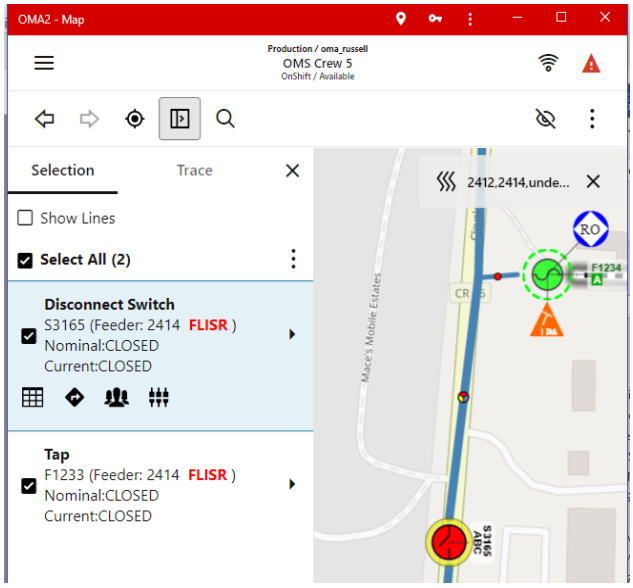
This panel displays information about the selected object(s) in the Map. From here you can select the required object and perform actions on the object.

- **Show Lines:** When selected, selected conductors are displayed in the list of objects as well as devices and other assets
- Select All: Selects or deselects all items in the list
- **Selection Options:** Tap ⋮ to access Feeder Highlighting Options:
- For a selected device or conductor, tap **Feeder Highlights** ( ) then click **Highlight Feeder**. Other feeders will be displayed less prominently, but still be selectable (so you can highlight additional feeders).
- To remove or clear feeder highlighting, click to select the feeder then choose Unhighlight or Clear Highlighting. You can also clear highlighting from the Highlighting indicator displayed in the top-right of the Map.

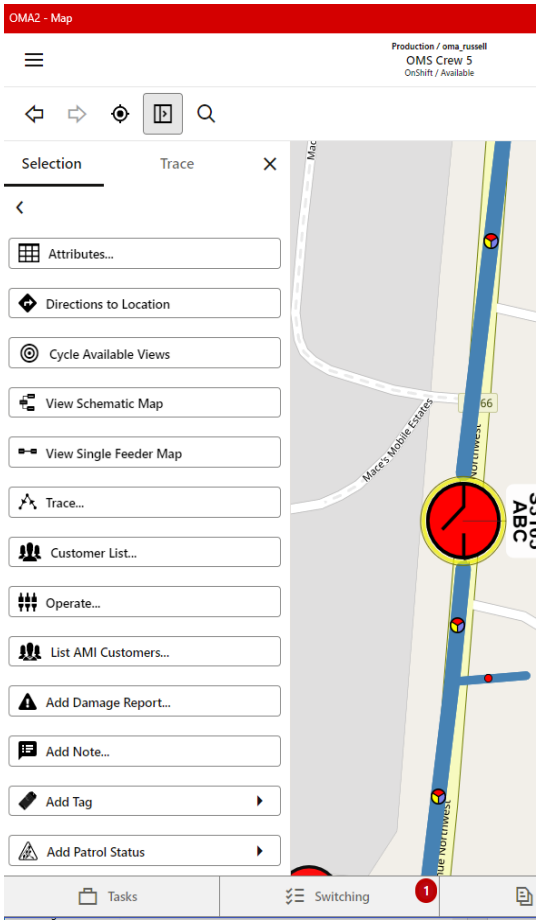
Perform Actions on a Selected Object

Tap on an object in the list to display a list of actions.

Common actions are displayed as icons beneath the selected item:



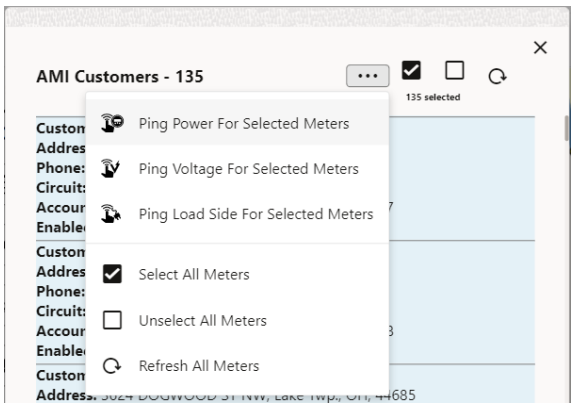
Access to all related actions are available by tapping on the ▶ icon:



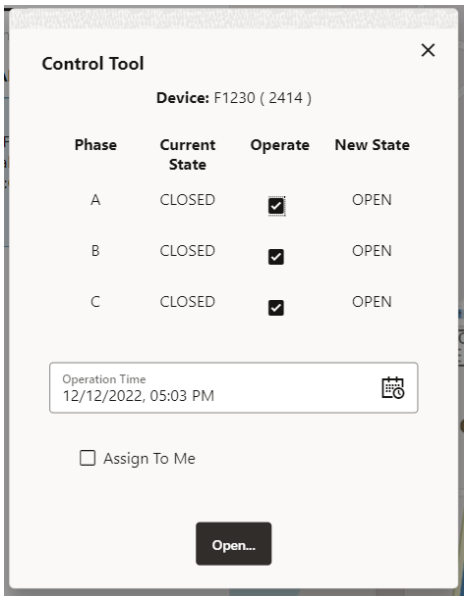
The potential list of actions is here:

- **Attributes**: Displays the Attribute List for the object.
- **Directions to Location**: Opens the devices native map/navigation system to the selected object
- **Cycle Available Views**: Focuses the map to an alternate view of the given object. Typically used to navigate the map between the geographic world and an internal view (substation).
- **View Schematic Map**: Focuses the Map on the object's position in the schematic network view
- **View Single Feeder Map**: Focuses the Map on the object's position in the Single Line network view
- **Trace…**: Switches to the **Trace** tab, which enables you to perform traces. See Traces, below
- **Customer List:** – Displays the list of customers downstream of the selected device.
- **AMI Customers:** Displays a list of customers with smart meters.
    - For a selected customer(s) you can send requests (ping) for meter information.

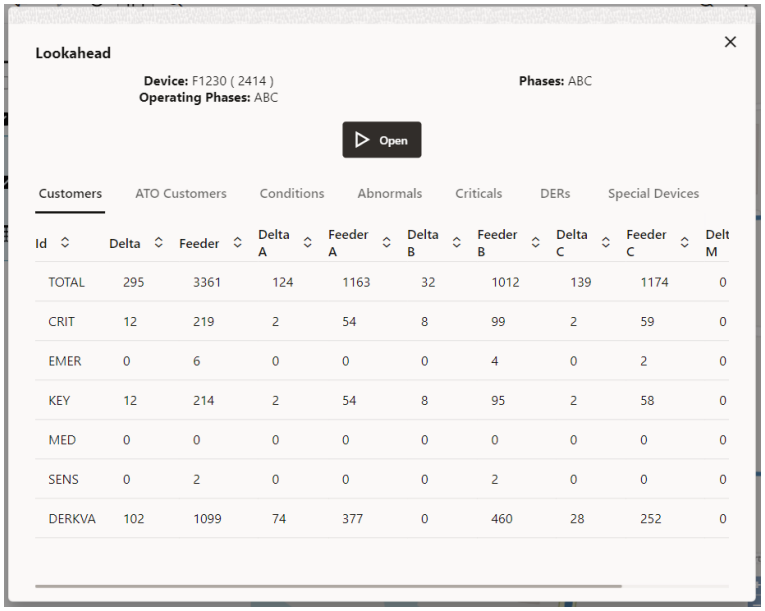
You can select all AMI customers in the list using the icon at the top of the dialog, and then choose the ping type from the icon:



- **Operate:** Enables you to operate the selected device:
  - Select the phases to operate
  - Enter the time the device was operated
  - Select Assign to Me if you want to add a task to your list of tasks for this device operation.



After tapping **Open** or **Close**, the Lookahead dialog is displayed:



Id	Delta	Feeder	Delta A	Feeder A	Delta B	Feeder B	Delta C	Feeder C	Delt M
TOTAL	295	3361	124	1163	32	1012	139	1174	0
CRIT	12	219	2	54	8	99	2	59	0
EMER	0	6	0	0	0	4	0	2	0
KEY	12	214	2	54	8	95	2	58	0
MED	0	0	0	0	0	0	0	0	0
SENS	0	2	0	0	0	2	0	0	0
DERKVA	102	1099	74	377	0	460	28	252	0

Visually verify the Customers and Conditions, then tap Open or Close to confirm the device operation.

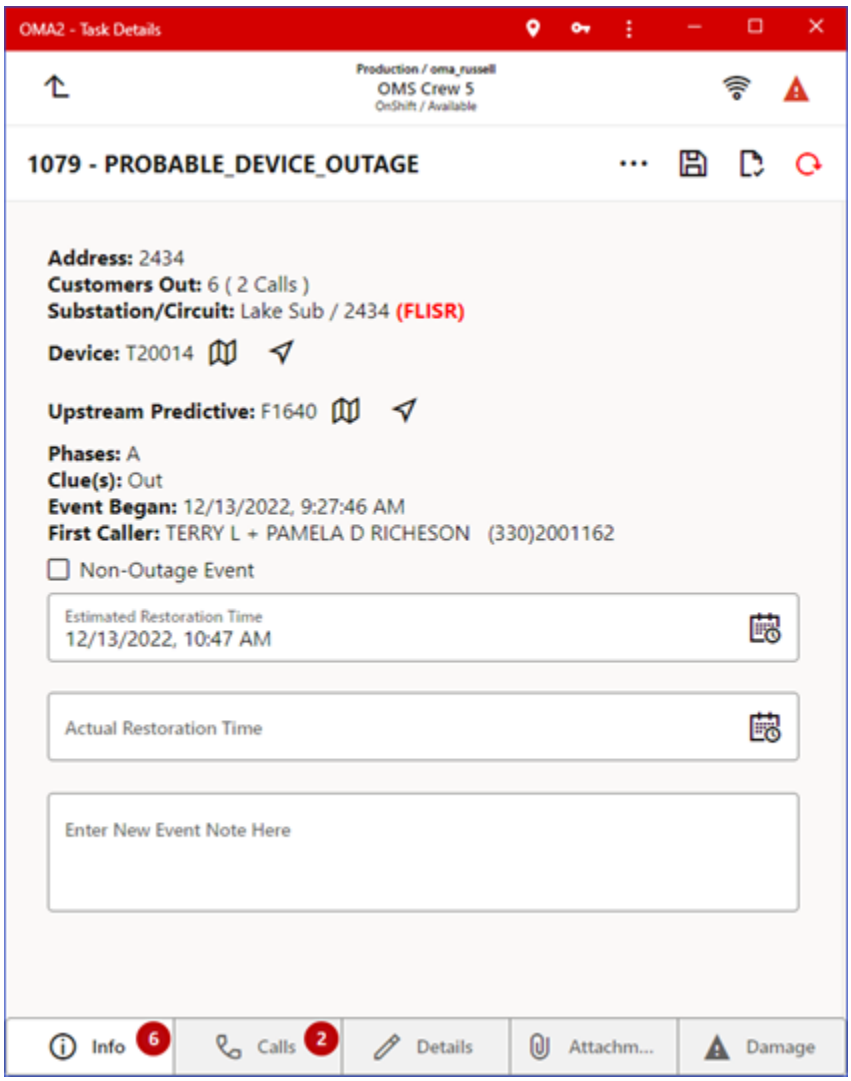
- **Add Damage Report:** Enables you to create a damage assessment
- **Add Note:** Enables you to add a note to the Map
- **Add Tag:** Enables you to add different tag types, as per your configuration.
- **Add Patrol Status:** Enables you to add different patrolling conditions.
- **Confirm Fault Location:** Enables you to confirm a predicted fault location
- **Mark Fault Incorrect:** Enables you to confirm a predicted fault location as incorrect.
- **Open Event:** Opens the Event Details for the selected object.
- **Open Patrol Event Details:** Opens the Patrol Event Details
- **Assign Event to me:** Assigns the event to yourself
- **Confirm Outage:** Marks Probable Event as a Real Event
- **Delete Condition:** Delete Condition (tag, note, …)

Understanding the Event Details Page - Full Operations User Type

The Edit Event Page may be comprised of up to six tabs, depending on the event type. This section includes the following topics.

- Understanding the Event Info Tab
- Understanding the Calls Tab
- Understanding the Faults Tab
- Understanding the Details Tab
- Understanding the Damage Tab

Understanding the Event Info Tab

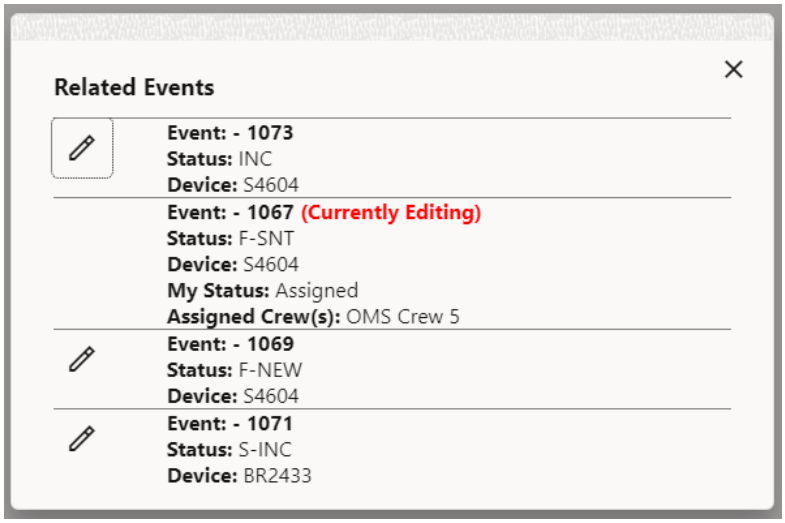


The **Event Info** tab will contain the following editable options:

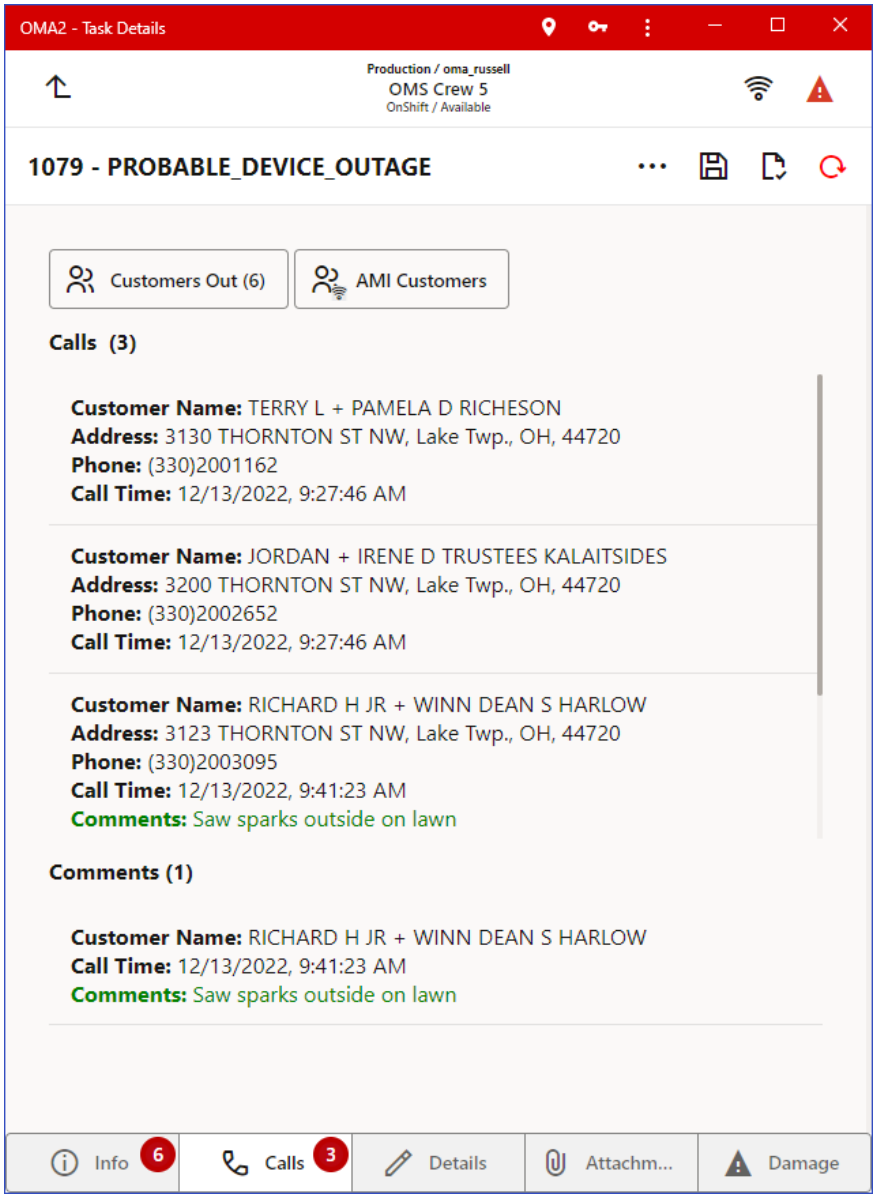
- A **Non-Outage Event** check box, if selected, sets the event to a non-outage.
- An **Estimated Restoration Time** field to edit the ERT.
- An **Actual Restoration Time** field to edit the restoration time.
- An **Enter New Event Note Here** field to add an event note.
- **Show Related Events** icon ( ) will identify the number of related events and, when tapped, will display a panel of the related events and allow you to edit one of them.
- A **Save** icon ( ) to save the changes.
- A **Complete** icon ( ) to save the changes and complete the event.
- A Refresh icon ( ) to reload the page with the latest data. The refresh icon turns red if there are available updates that have not been displayed.Related Events Panel

Related Events Panel

The related events panel will list details about events that are related to the event being edited. Use the edit icon ( ) to switch the editing event.



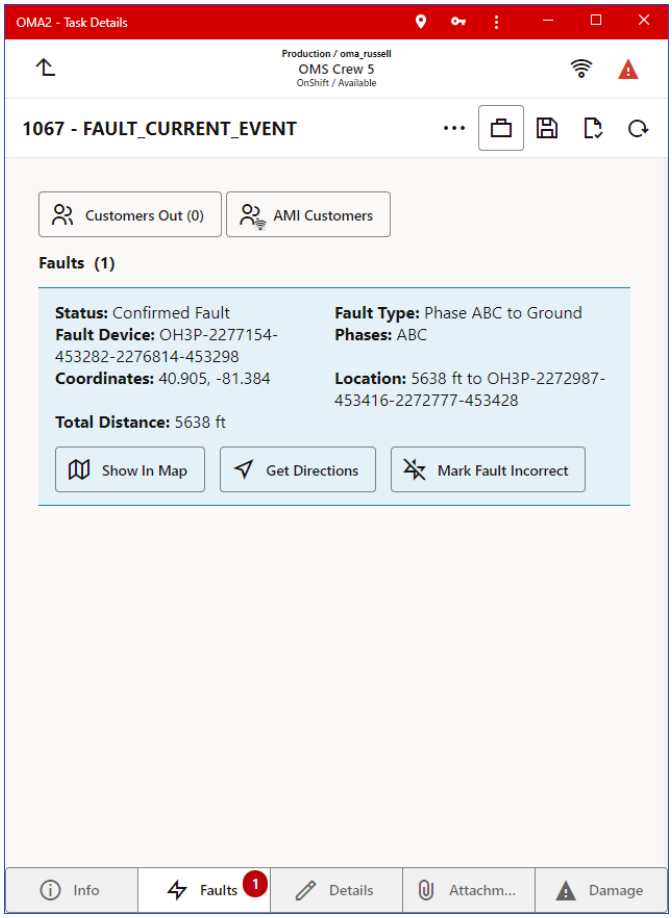
Understanding the Calls Tab



The Calls tab lists calls for the outage or non-outage event. This contains the following options for the selected row.

- : Focus the Map on the customer or customer's supply point.
- : Get directions to the customer's supply point using the device's native navigation app to assist you in driving to the call location.
- : View a list of the customers affected by this event.
- : View a list of the smart meters customers affected by this event.

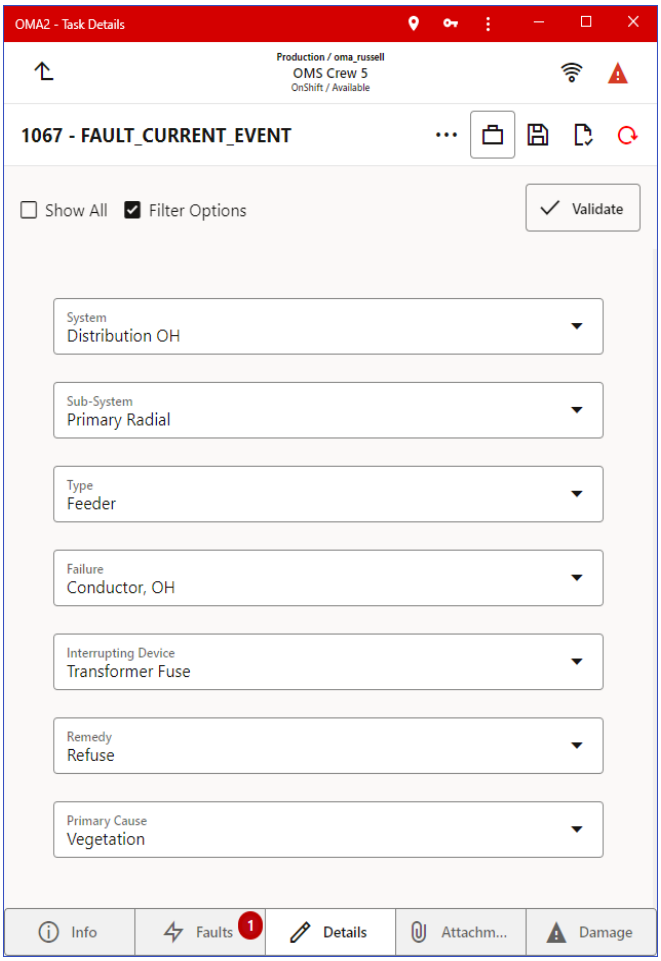
Understanding the Faults Tab



The **Faults** tab lists probable fault locations for the fault event. For the selected row you can.

- Focus the Map on the fault location.
- Get directions to the fault location, using the device's native navigationapp to assist you in driving to the fault location.
- Mark the fault location as confirmed or incorrect , dependingon the status of the fault location.
- View a list of the customers affected by this event.
- View a list of the smart meters customers affected by this event

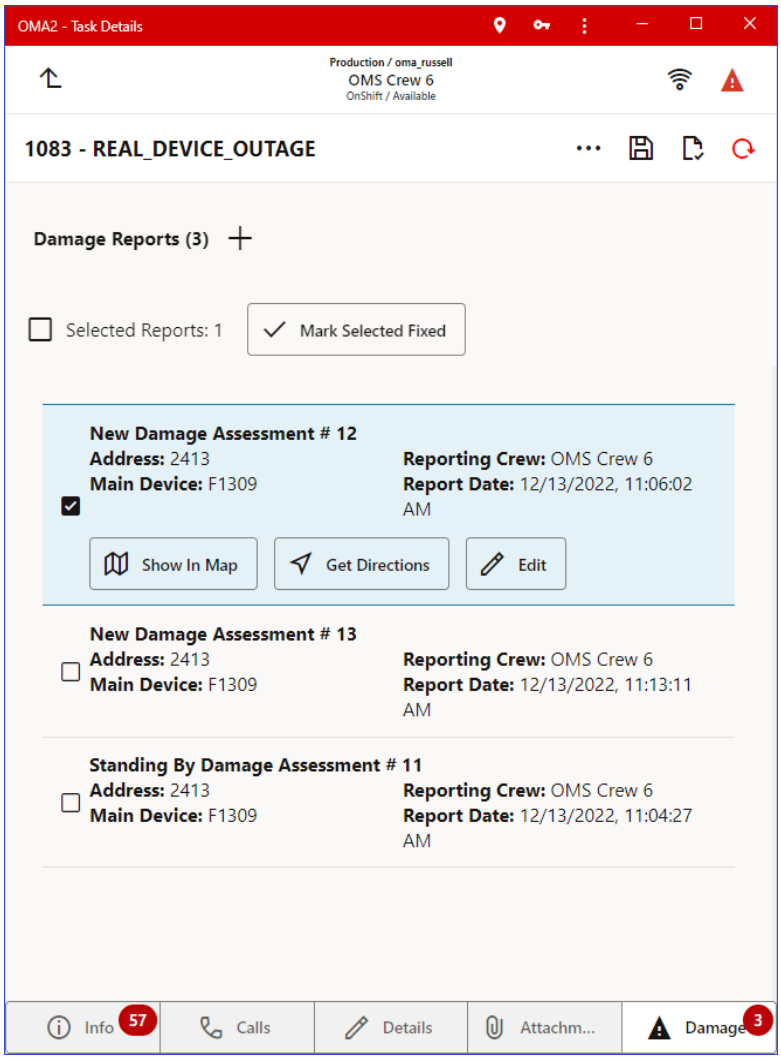
Understanding the Details Tab



The **Details** tab allows you to enter completion details for the event and, optionally, complete the event. When you tap the **Complete** icon ( ), the system will verify that you have all of the completion requirements satisfied before submitting to the server; if you are missing required data, the **Details** page will highlight any fields that are missing data.

Understanding the Damage Tab

The **Damage** page contains list of damage assessments for the event.



Each damage assessment is displayed as a card containing the following information:

- Damage assessment state and identifier; for example, in the screen capture above, the state is 'Assessed' and the identifier is 'Damage Assessment #1'.
- **Address:** The address where the damage is.
- **Main Device:** The main damaged device.
- **Report Date:** The damage assessment date and time.

Each card can contain several buttons for the available actions (some buttons can be hidden if the action is not applicable):

- **Show in Map** ( ) switches to Map tab and focuses map on the damage assessment location.

- **Navigate** ( ) opens damage assessment location in external mapping application (for example, Google Maps).
- **Edit** ( ) opens Damage Assessment page for this damage assessment.
- The **Add Damage Assessment** button ( ) allows you to enter new damage assessment for the event.

Editing Damage Assessments

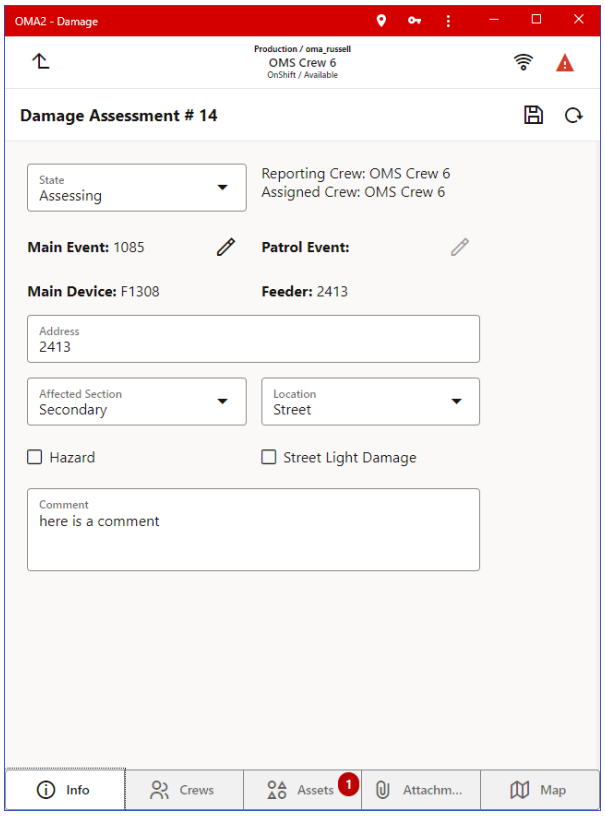
The Damage Assessment page allows you to create, edit, and view damage assessments.

The page header contains damage assessment identifier and buttons to save ( ) and reload ( ) damage assessments from the Network Management System server.

The Damage Assessment page provides five tabs which allow you to access different damage assessment details; Info, Crews, Assets, Attachments, and Map.

Using the Damage Assessment Info Tab

The Info tab contains general damage assessment information.



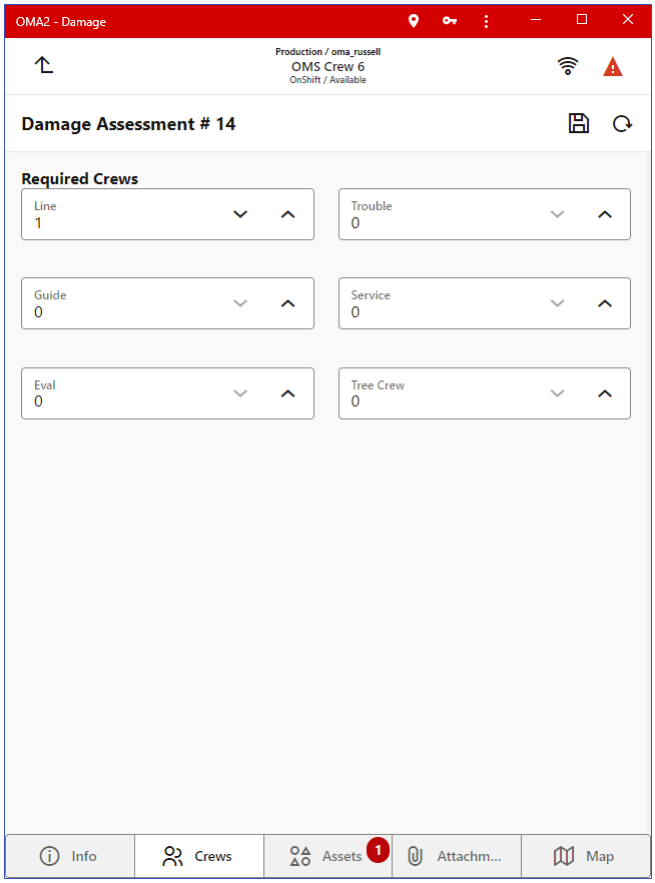
The Damage Assessment **Info** tab provides the following information:

- **State:** Allows you to select the state of the Damage Assessment (Assessed, Standing By, Obsolete, and Fixed).
- **Reporting Crew:** The name of the crew that reported the damage.

- **Assigned Crew:** The name of the crew that is assigned to perform the damage assessment.
- **Main Event:** The event associated with the main damaged asset. Tap the edit button to open the Event Details page (if it is assigned to you).
- **Patrol Event:** The patrol event associated with this damage assessment. Tap the edit button to open the patrol event (if it is assigned to you).
- **Main Device:** The main damaged device.
- **Address:** Allows you to enter the address where the damage is.
- **Feeder:** The feeder where damage is located.
- **Affected Section:** Allows you to select the affected section of the electrical network.
- **Location:** Allows you to select the damage location.
- **Hazard:** Allows you to select whether damage is hazardous.
- **Street Light Damage:** Allows you to select whether street light damage has occurred.
- **Comment:** Allows you to enter comments.

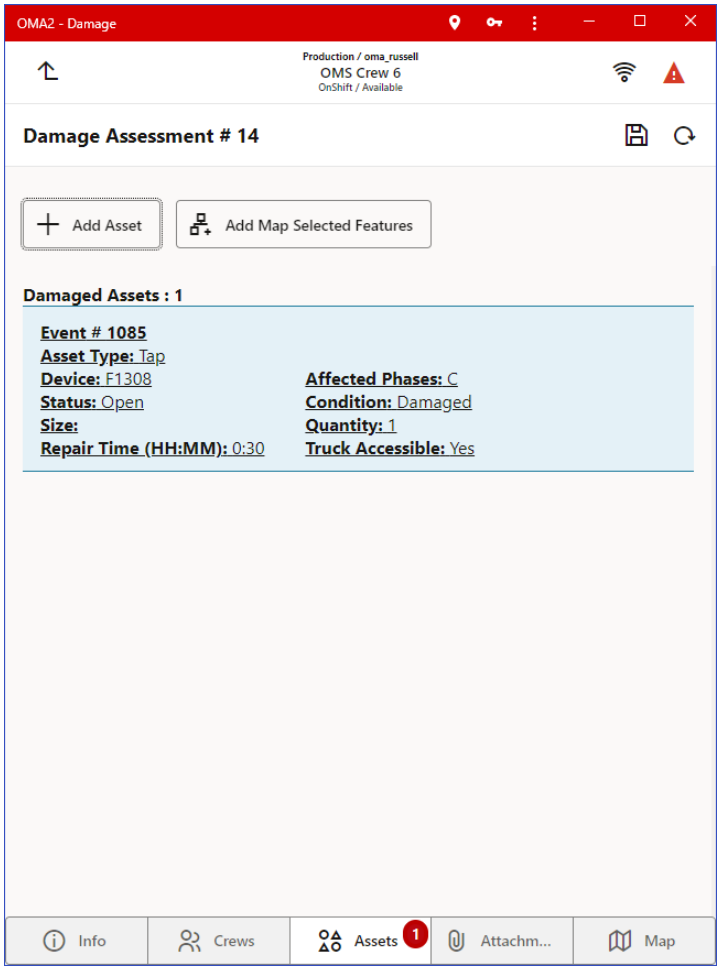
Using the Crews Tab

The Damage Assessment **Crews** tab allows you to identify the type and number of crews needed to repair the damage.



Using the Assets Tab

The Damage Assessment **Assets** tab allows you to view, modify, add, and delete assets that are part of the damage assessment. Each damage assessment contains one main damaged asset. It can be identified by underscored text (typically it is the first listed asset).



Each damaged asset is displayed as a cards that contains the following information:

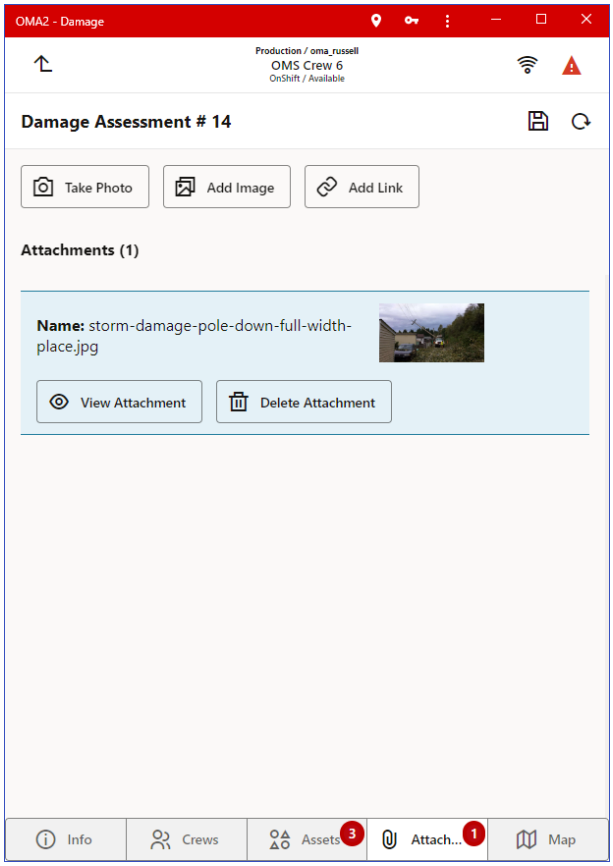
- **Event #:** The event associated with the asset.
- **Asset Type:** The damaged asset type.
- **Device:** The damaged device (only for modeled asset).
- **Affected Phases:** The affected phases.
- **Status:** The asset status (`Open`, `Closed`, `N/A`).
- **Condition:** The asset condition.
- **Size:** The asset size (for example, pole length or fuse rating).
- **Quantity:** The number of damaged assets (always 1 for modeled assets).
- **Repair Time:** The repair time in hours and minutes.
- **Truck Accessible:** Whether the asset location is truck accessible.

Each card can contain several buttons for the available actions (some buttons can be hidden is action in not applicable):

- **Map** ( ) switches to Map tab and focuses map on the damaged asset location.
- **Navigate** ( ) opens damaged asset location in external mapping application (for example, Google Maps)
- **Edit** ( ) opens Damaged Asset dialog
- **Delete** ( ) marks asset for deletion. Assets marked for deletion are crossed out
- **Make Main Asset** ( ) makes asset the main damaged asset for the damage assessment
- The **Add Map Selected Features** button () switches to the Map, and allows you to select an object on the Map as a damaged asset.
    - **Asset Type:** Allows you to select the damaged asset's type, such as
    - Transformer.
    - **Status:** Allows you to select whether the device is **Open** or **Closed**, if applicable.
    - **Condition:** Allows you to select from a list of possible conditions applicable to the device (for example, Damaged, Down, and so on).
    - **Phases Affected:** Allows you to select the phases affected by the damage, if applicable.
    - **Size:** Allows you to enter the asset size. The meaning of size differs depending on the asset type. For example, for a pole, size can be length ofthe pole in feet, for a fuse, it can be rated current in amps, and so forth.
    - **Quantity:** Allows you to enter the number of instances of the damagedasset.
    - **Truck Accessible:** Toggle button allows you to indicate whether thedamage location is truck-accessible.
    - **Create Separate Event:** Toggle button allows you to create a separate event for this damaged asset.
    - **Repair Time:** Allows you to enter the time needed to repair the damaged asset.
    - **Latitude/Longitude:** Allows you to set the damaged asset location from your current location or the last selected location.
    - **Comments:** Allows you to enter a comment with other information about the damaged asset.
- The **Add Map Selected Features** button ( ) allows you to add objects selected onthe map as damaged assets. To do this, navigate to the **Map** tab, select one or more objects on the map, navigate back to the **Assets** tab, and then tap the **Add** assets selectedon the map button.

Using the Attachments Tab

The **Attachments** tab allows you to view, add, and delete attachments to the damage assessment. There are two types of attachments: file attachments and link attachments (contain URL of attachment stored elsewhere).



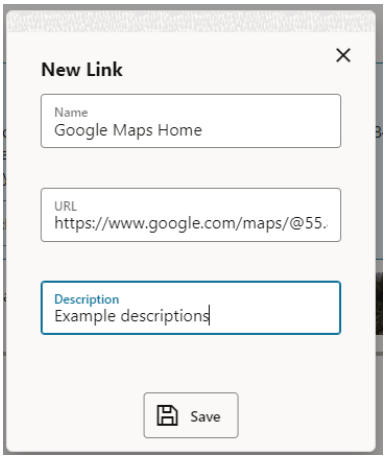
Each attachment is displayed as a cards that contains the following information:

- **Name:** Attachment name.
- **URL:** Attachment URL (only for link attachments).
- **Description:** Attachment description.

For image attachments thumbnail is displayed on the right side of the card.

Each card contains the following buttons:

- **View** ( ) opens the attachment. Link attachments are opened in web browser and file attachments are opened in the application associated with the file type
- **Delete** ( ) marks attachment for deletion. Attachments marked for deletion are crossed out
- The **Take Picture** button ( ) allows you to take a picture using mobile device built-in camera and add it as an attachment.
- The **Add Image** button ( ) allows you to select a file from mobile device picture gallery and add it as an attachment.
- The **Add Link** ( ) button opens the New Link dialog which allows you to add new link attachment.

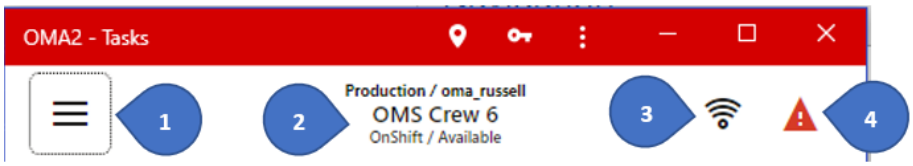


Using the Map Tab

The Damage Assessments **Map** tab is a convenient way to navigate to the **Map** page.

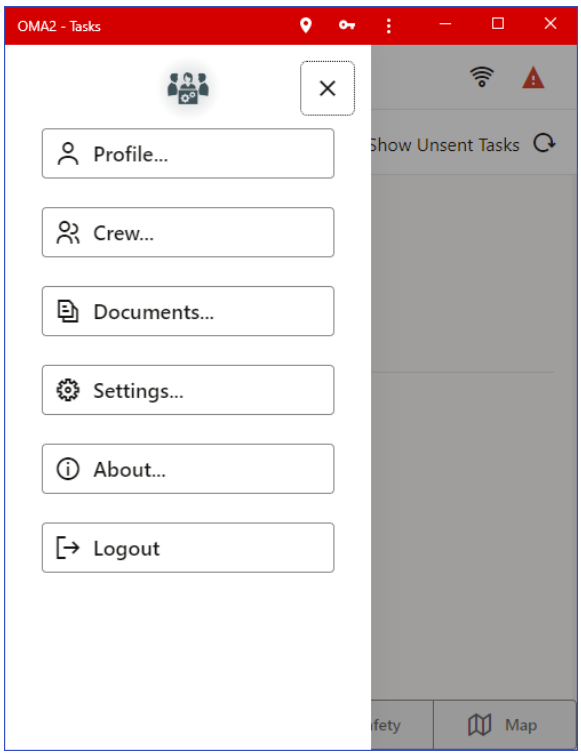
Understanding the Main Menu - Full Operations User Type

The main menu bar has four major sections:



1. The Main Menu icon

   The Main Menu opens the side panel with the main menu options:



   Each Main menu option will be describe in sections that follow.

   - Understanding Your Profile
   - Understanding Crews
   - Using the Documents Page
   - Understanding Settings
   - About
   - Logout

2. The OMA user and Crew status – This section will inform the OMA user of the NMS server they are connected to, their user name they logged in with, the crew they are associated with and the crew status and availability.

3. The Network Status – This will let you know the network status of the device and will have three modes:

   - The device is connect to the network and has a good connection to the NMS server.

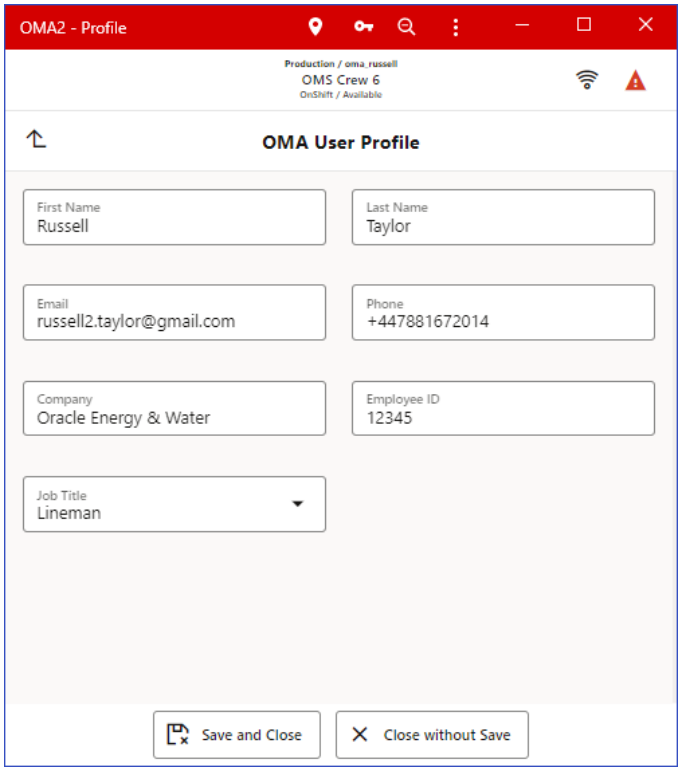
   - The device is connect to the network and the NMS server is not responding

   - The device is not connect to any network and the NMS server is not reachable.

4. The Crew Emergency icon – This will bring up the crew emergency popup and will give you the opportunity to cancel the emergency or to notify the NMS system of the emergency. If you do not respond, the notification will happen automatically after a timeout period. Once in Emergency mode, the icon will turn yellow and a subsequent selection of the icon will allow you to cancel the emergency if you can enter your login password.

Understanding Your Profile

A completed profile is required for all OMA users and will automatically pop up when you log in for the first time. You are required to populate the entire profile in order to continue to use OMA:

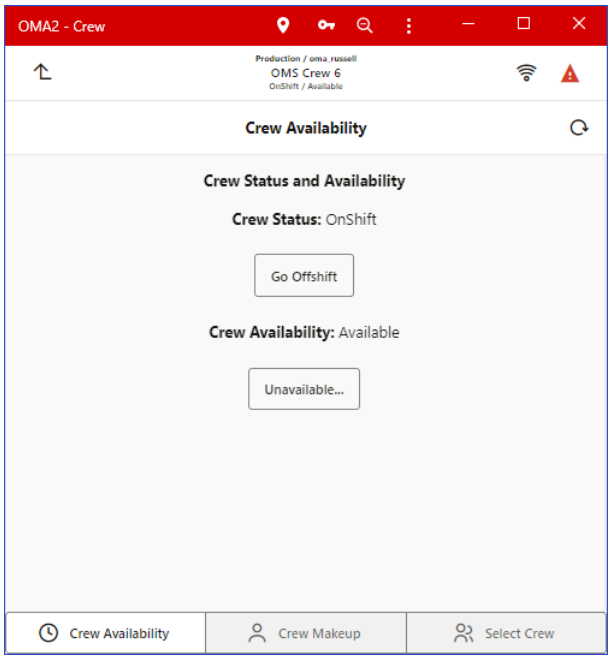


Understanding Crews

The crew page contains the following tabs:

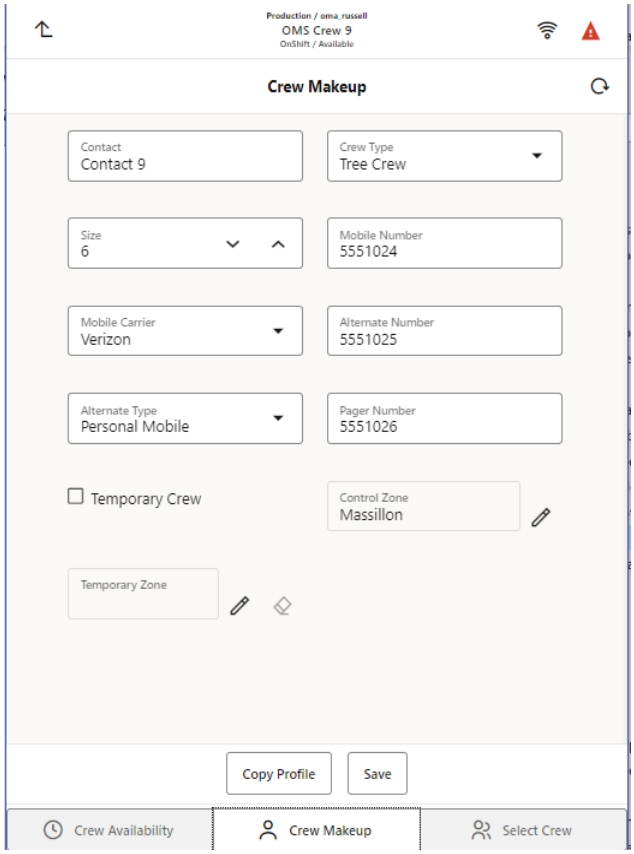
1. The **Crew Availability** tab

   The crew availability tab allows you to put the crew on or off shift and allows them to identify the crew as unavailable (Meeting, Coffee, …) and back to available:



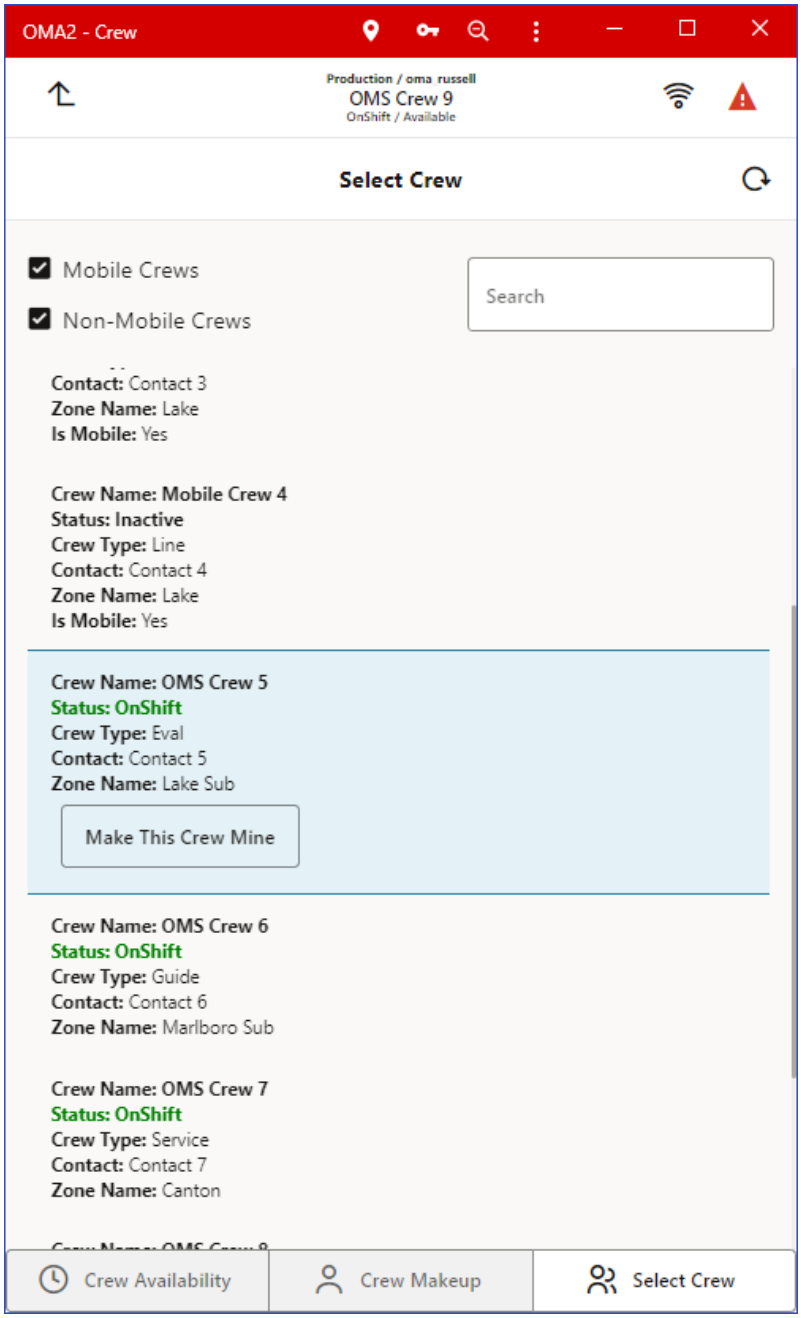
2. The **Crew Makeup** Tab

   The **Crew Makeup** tab allows you to update the details about the crew they are associated with:



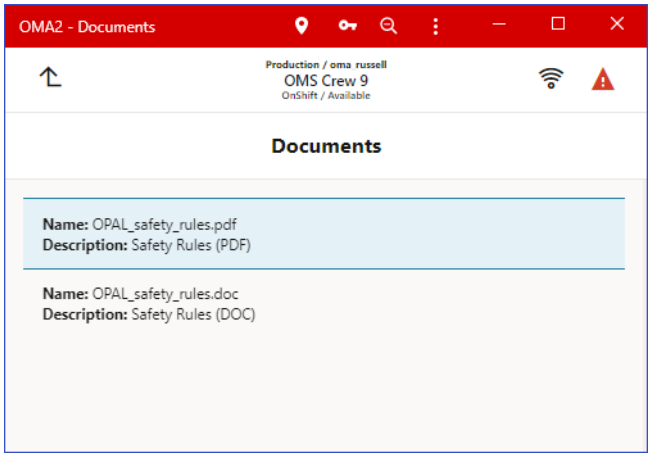
3. The **Select Crew** Tab

   The **Select Crew** tab is available to users with permission to change their associated crew. To associate yourself with a crew, select the crew card and then hit the check mark. Your associated crew will then appear on the top of the main menu bar.


OMA2 - Crew
Production / oma_russell
OMS Crew 9
OnShift / Available
Select Crew
Mobile Crews
Non-Mobile Crews
Search
Contact: Contact 3
Zone Name: Lake
Is Mobile: Yes
Crew Name: Mobile Crew 4
Status: Inactive
Crew Type: Line
Contact: Contact 4
Zone Name: Lake
Is Mobile: Yes
Crew Name: OMS Crew 5
Status: OnShift
Crew Type: Eval
Contact: Contact 5
Zone Name: Lake Sub
Make This Crew Mine
Crew Name: OMS Crew 6
Status: OnShift
Crew Type: Guide
Contact: Contact 6
Zone Name: Marlboro Sub
Crew Name: OMS Crew 7
Status: OnShift
Crew Type: Service
Contact: Contact 7
Zone Name: Canton
Crew Availability
Crew Makeup
Select Crew

Using the Documents Page

The **Documents** page lists any files or documents made available for the crew:



If you tap a file in the list, you will have the option to view or download it.

Understanding Settings

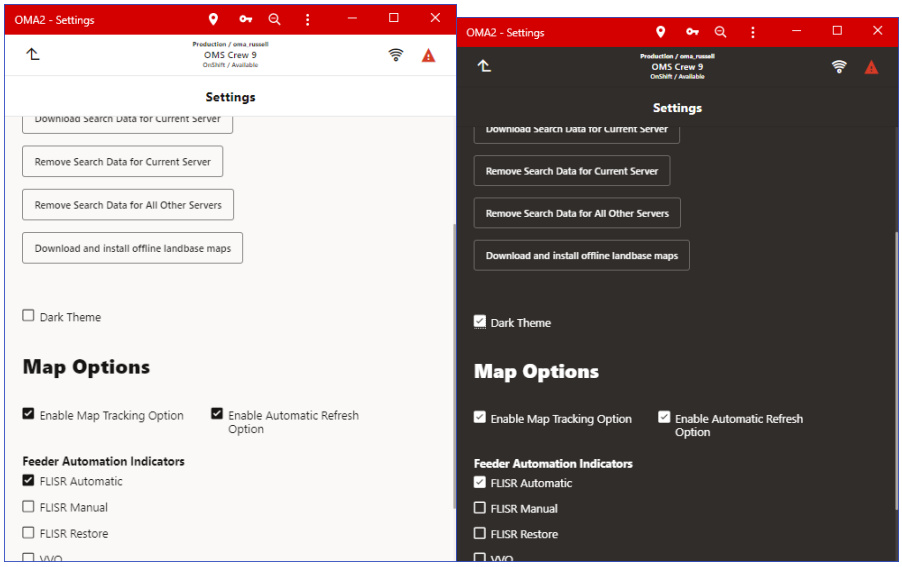
The **Settings** page provides options for data management, map option, and other visual indications.

Data Management

Enables you to download or remove map and search data currently stored on your device. The next time you log on you will be prompted to download the maps again.

Theme

You may switch between the Light Theme and the Dark Theme



Map Options

Enable Map Tracking Option

When selected, the **Enable Map Tracking Option** check box enables the **Track Current Location** function. (Track Current Location is available from the GPS Location menu and automatically keeps the Map centered on your position as you move)

Feeder Automation Indicators

When selected, these provide additional information to Crews about the DMS status of feeders. These indications are displayed on the **Task Details** cards and the Map **Selection Panel**, for the selected device

Other options may be made available to you based on project requirements.

About

The **About** page provides information about the application and associated servers.

- Application Information
  - **Product Version:** The OMA release that is running.
  - **Project Version:** The version number for a build of OMA with project specific customizations.
  - Application Key
- **Application Server:** Information about the NMS application server.
- **Mobile Server:** Information about the NMS mobile gateway server.

Logout

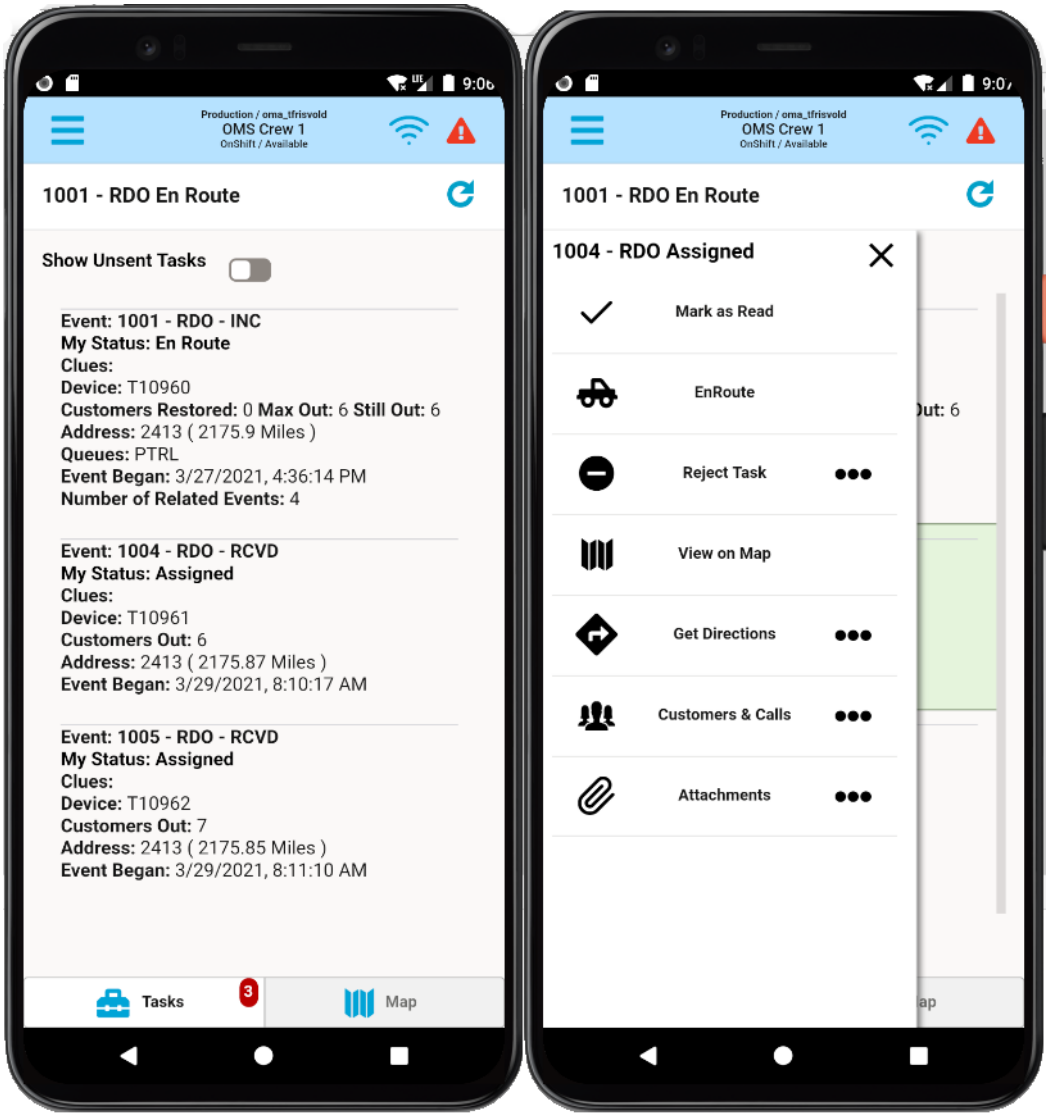
To log out, select the main menu and the **Logout** button. On logout, you may be asked a number of questions, for example:

- Would you like to suspend your active jobs?
- Would you like to mark your crew as off-shift on logout?

Understanding User Types

The OMA template now supports different user types. The below are the base set of user types, although a utility can add, remove, or edit the user types.

1. **Full Operations User Type:** The OMA Full Operations user type includes all of the OMA functionality defined in the preceding sections. Based on user permission, some features may or may not be available to a given user.
2. **Damage Assessor User Type:** The OMA Damage Assessor user type only has the tasks and map tabs; the switching and safety tabs are not available. The task details tabs will all be the same as the Full Operations user type except the Damage Assessor will not be able to set the actual restoration time on the task details info tab. Most map tab functionality is available except for the control tool and there is no ability to place tags.
3. **Hazard Responder User Type:** The OMA Hazard Responder user type only has the tasks and map tabs; the switching and safety tabs are not available. The task list supports actions to update crew status, view customers and calls, add or view an event note or attachment (such as a photo), or enter a damage assessment. Map functionality is limited to searching and viewing data, or entering a damage assessment. This user type also changes the user experience to better support mobile phone-sized devices; for example, the display scaling is set to 100 percent regardless of the scale set in the OMA Settings panel.
4. **View Only User Type:** The OMA View Only user type only contains the map tab; no other tabs are provided. Map functionality is limited to searching and viewing data.



In addition to the different user experience, the hazard responder slide menu will be context sensitive to the selected task and will only show options available to the task status. The only main page tabs available to the hazard responder will be the task tab and the map tab. In the map tab, the hazard responder will not have access to the device control tool, will not be able to place tags or patrol conditions and will not be able to alter events (confirm an RO).

Projects are able to change the functionality of the product template configured user types and they can use these user types as examples to build additional user types.

Chapter 27

Flex Operations

This chapter describes the Oracle Utilities Network Management System Flex Operations client. It includes the following topics:

- Getting Started with Flex Operations
- Understanding the Flex Operations Workspace
- Managing Outage Events
- Managing Damage Assessments
- Working with Event Details
- Understanding the DMS Status Summary
- Understanding Switching in Flex Operations
- Understanding Safety Documents
- Using the Miscellaneous Log
- Working with the Map

Getting Started with Flex Operations

The Flex Operations client is a browser-based application that allows you to support control room staff by quickly logging on and helping to manage outages, crews, and other storm processes. The Flex Operations clients run on desktops and laptops (tablets and smartphones are not supported); see the *Oracle Utilities Network Management System Quick Install Guide* for supported platforms.

Logging In

1. Launch the web link provided by your System Administrator.
2. Enter your **User ID** and **Password**, then click **Validate**.
3. Select your **User Type**, then click **Login**.

   Note: For information on **User Type** options, see **Understanding User Types** on page 1-2.

Logging Out

On the Workspace Banner, click your **User ID** and then select **Logout**.

Note: Closing the browser is the same as logging yourself out.

Using the Authority Dialog Box

When you are using the Flex Operations client, you only see events and crews for the areas (or zones) of authority that you are subscribed to. When you log in, you are prompted to subscribe to authority areas, but you can also change your areas of authority at any time (see **Adding and Removing Areas of Authority** on page 27-2 for more information).

Subscribing to Areas of Authority after Logging In

When you log in, the Authority dialog box, which lists all Authority Zones, is displayed. To subscribe, do the following:

1. Expand the zones as needed and select the ones that you wish to subscribe to
2. Click **Subscribe and Close**.

The **Events and Crews** tool updates to show outages and crews for the areas you subscribed to.

Adding and Removing Areas of Authority

You can change your areas of authority at any time. Select **Authority** from the Workspace Banner **Tool Selector** ( ) drop-down list (see **Understanding the Tool Selector** on page 27-4 for more information on the **Tool Selector** selection options).

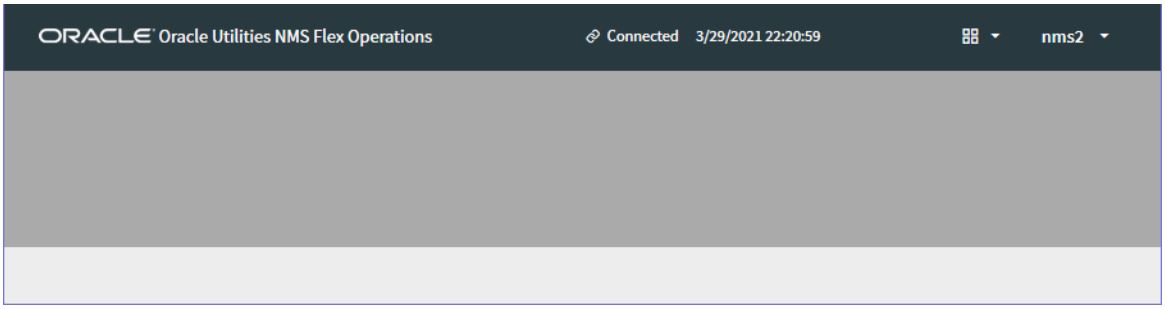
When the Authority dialog box opens, you can add subscription areas or unsubscribe.

- To add one or more areas, select the areas using the check boxes, or select the parent to select it and all child zones, then click **Subscribe and Close**.
- To unsubscribe from areas you own, select the area(s), then click **Unsubscribe**, then close the tool.

Understanding the Flex Operations Workspace

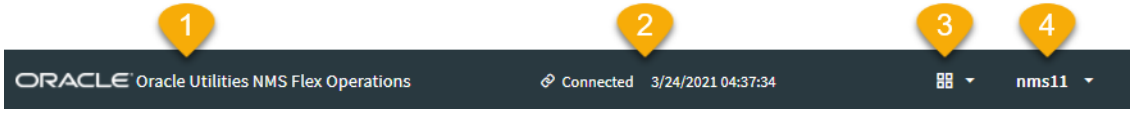
The Flex Operations workspace is displayed after successfully logging on.

The workspace is comprised of a banner and a panel for displaying tools (for example, **Events and Crews** and **Event Details**).



Understanding the Workspace Banner

The Flex Workspace banner displays connection information and access to the tools you need to manage outages:



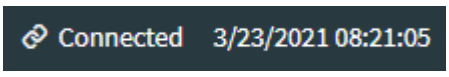
The banner contains the following information and interaction buttons.

1. Application Name
2. Connection Indicator
3. Tools Selection Menu
4. User Menu

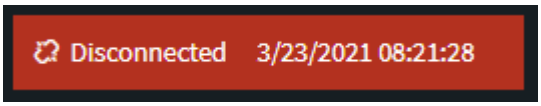
Understanding the Connection Indicator

The Connection Indicator shows the client's connection status and a system time based on that status.

- Connected clients display a link symbol, the word *Connected*, and the current system (server's) date and time.



- Disconnected clients display a broken link symbol, the word *Disconnected*, and the date and time when the disconnect occurred.



Note: You cannot view or edit any information while disconnected.

Understanding the Tool Selector

The **Tool Selector** ( ) provides a drop-down list of tools that you may open or switch between. The options are:

- **Events and Crews:** Displays the Events List and the Crews List; see **Working with the Events and Crews Tool** on page 27-16.
- **DMS Status Summary:** Displays the DMS Status Summary; see .
- **Map:** Displays the **Map**; see **Working with the Map** on page 27-29.
- **Authority:** Opens the Authority dialog box, which allows you to subscribe or unsubscribe from control zones; see **Using the Authority Dialog Box** on page 27-2.
- **Switching Sheet List:** Opens the Switching Sheet List; see **Understanding Switching in Flex Operations** on page 27-48.
- **Miscellaneous Log:** Opens the Miscellaneous Log; see **Using the Miscellaneous Log** on page 27-54.
- **AMI Requests:** Opens the AMI Requests tool; see **Working with AMI Requests** on page 27-46.

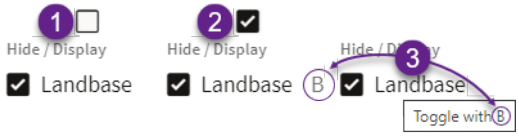
  Note: To close a tool, click the **Close** button ( ) on the tool's tab or in the tool's title bar.

Understanding the User Menu

The **User** menu provides the following options.

- **About:** Displays version and other application information.
- **Settings:** Launches a Settings dialog box that allows you to configure the appearance or behavior of certain user interface elements.
  - **Dark Theme:** Switches the user interface to a dark theme, which is suitable for low light conditions. This setting is saved with your User Preferences.
  - **Alternate Row Coloring:** When selected, data table rows will have alternating colors.
  - **Allow Clicking Table Headings to Sort:** When selected, you can click the column heading to sort the table on that column. If it is not selected then you must use the Sort button on the Sort/Quick Filter toolbar that is displayed beneath column headings when they are hovered with the mouse or touched on a touch enabled device. See **Understanding Table Sorting** on page 27-9 and **Understanding Table Filtering** on page 27-10 for more information on sorting and filtering tables.
  - **Show Shortcut Text on Checkboxes/Radio Buttons:** When selected, check boxes and radio buttons will show an associated shortcut key in their label, if one exists. This setting allows you to disable the label shortcut text if you feel you are familiar enough with them. For example, in the illustration below, the Map **Hide/Display Landbase** option is not showing a shortcut when the check box (from this **Settings** option) is deselected [1] and showing the shortcut (B) when the check box is selected [2]; any configured

shortcuts for check boxes and radio buttons will always be shown in the tooltip if hovered with the mouse [3].



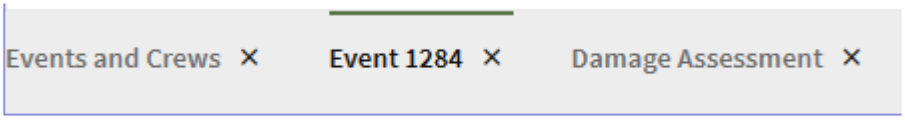
- **Thicker Scroll Bars:** When selected, makes vertical and horizontal scroll bars wider than their default. This setting is saved with your User Preferences.

  Note: If you are using a mouse with a scroll wheel, it is generally faster to scroll through the table. See **Scrolling Using a Mouse Scroll Wheel** on page 27-6.

- **Logout:** Logs you out of Flex Operations.

Understanding the Tabbed User Interface

You can toggle between tools by using the tabs at the bottom of the Workspace. Most tools open a tab at the bottom of the Flex Operations client workspace.

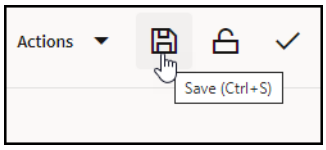


You may switch between tools by clicking the tool's tab. For some tools, when you open a different instance (such as an event or switching sheet), the tab updates with the identification of the current instance; for example, if you have Event 1284 open in Event Details, and then open Event 1285, the tab will update to **Event 1285** and load that event's data.

Understanding Common User Interactions

Using Keyboard Shortcuts

Many buttons and tabs have keyboard shortcuts. Hover over the component to display the shortcut.



Many single-action dialogs that allow text entries also provide a **Ctrl+Enter** shortcut to save the text and confirm the dialog.

Setting Font Size

The font size in Flex Operations is tied to the browser magnification. Change the font size by holding down the **Ctrl** key and rolling the mouse wheel toward or away from you.

Scrolling Using a Mouse Scroll Wheel

Vertical Scrolling

Use the scroll wheel to scroll vertically (up and down) through a list.

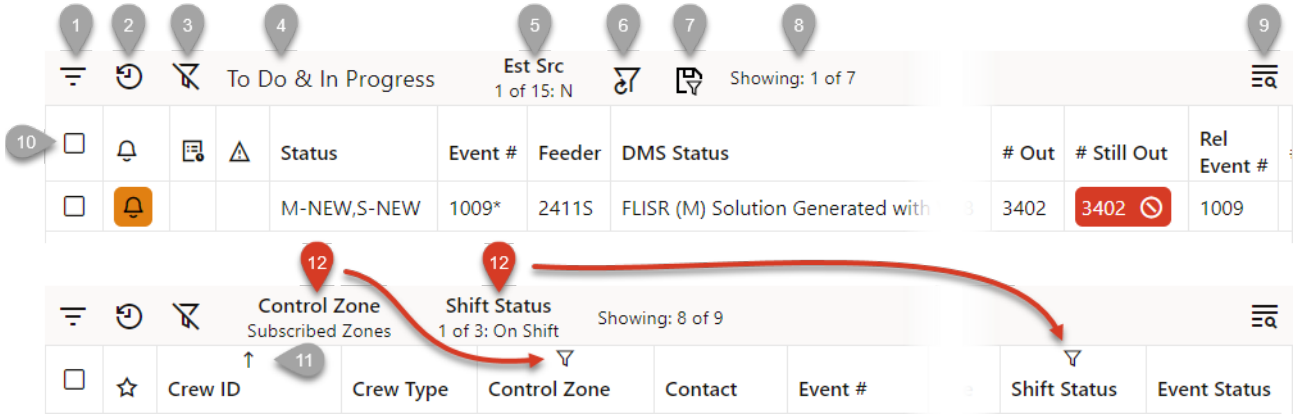
Horizontal Scrolling

Press and hold the **Shift** key while turning the scroll wheel to scroll horizontally (side to side).

Understanding Common Table Features

Understanding Table Components

The following image shows an illustrated screen capture of a table showing call outs for the components.



1. **Filter Pane** button ( ); see **Understanding Table Filtering** on page 27-10 for details.
2. **Filter and Selection History** ( ) shows a list of recent filters, which may include **Column Quick Filter** additions, and selected rows. See **Understanding Quick Filters** on page 27-12 for more information on column filters.
3. **Disable Filtering** button ( ) temporarily disables (removes) currently applied filters; clicking the button again restores the filters.
4. The applied filter name (for example, *To Do & In Progress*).
5. *Column Filter* results shows the column being filtered and the number of rows that meet the column filter criteria; see **Understanding Quick Filters** on page 27-12.

6. **Reset All Column Filters** button ( ) removes any quick filtering selections; see **Understanding Quick Filters** on page 27-12 for more information.
7. Save the **Current Filters** button ( ) allows you to save the combination of the filter and column quick filter criteria.
8. Filter results; see **Understanding Table Filtering** on page 27-10 for details.
9. The table **Search** button. See **Understanding Searching in Tables** on page 27-13 for details on using the Search feature.
10. The header row check box allows you to select all of the table rows.
11. The column sort arrow icon shows the current sort direction for that column; clicking it will sort the table by that column. See **Understanding Table Sorting** on page 27-9 for details.
12. The column filter button ( ) appears on any column being used in a quick filtering. When you click the button, the values available to filter on are listed allowing you to modify the quick filter; see **Understanding Quick Filters** on page 27-12.

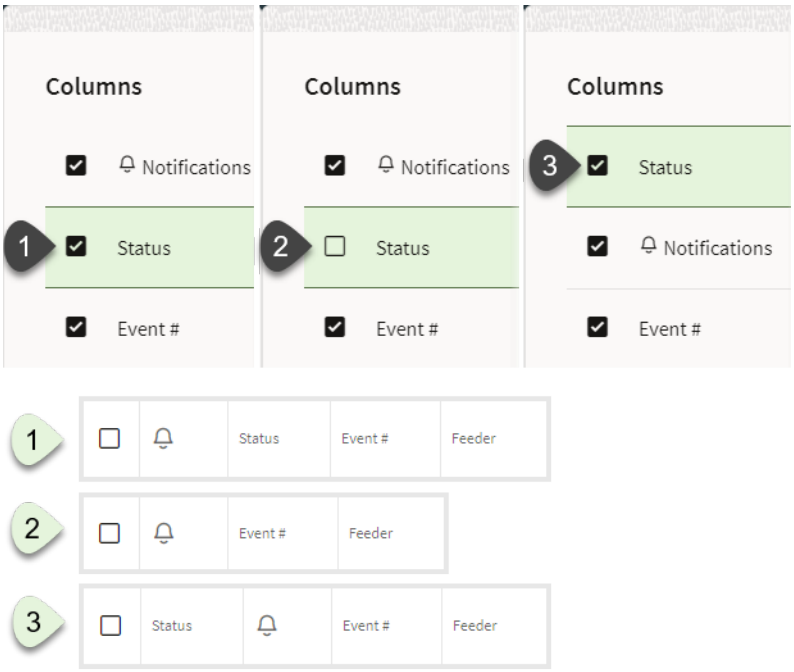
Changing Column Order and Display

There are a number of options to reorder (move) and hide columns.

- Select a column heading and drag the column to its desired new position.
- Right click a column header and select **Hide Column** to hide the column.
- Right click a column header and choose **Organize Columns...** to open the Columns dialog box that allows you to reorder and hide columns.
  - Hide or show columns by deselecting or selecting them, respectively.
  - Reorder columns by dragging the column row up or down the list.
  - Use the positioning buttons to move the column to the top of the list (first column in table), up one position (left in table), down one position (right in the table), or to the end (last column in the table).

Example

The Events List table showing the Status column [1] selected and displayed, [2] deselected and hidden, and [3] displayed and moved to the left in the table.



Changing Column Widths

Move the mouse pointer over a column heading vertical separator until it changes shape, then click and drag the column to its desired width. You can also right click on any column header and choose **Auto Size Column** or **Auto Size All Columns** to let the system auto-correct column widths.

Restoring List Defaults

Right click any header and choose **Restore Default Settings** to revert all display changes that you have made to that list.

Using Right-Click Context Menus

In lists like **Events** and **Crews**, commonly accessed functions are available from the right-click context menu. Switching steps can also be progressed through right-click context menus.

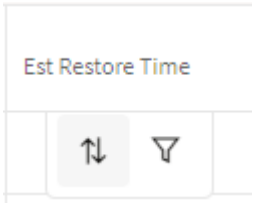
Revealing Additional Row Information

In many lists, double-clicking a row will display more information about the row. For example, double-click an **Events** row to open its **Event Details**.

Understanding Table Sorting

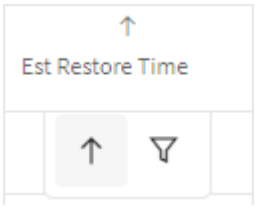
Sorting by a Single Column

Tables may be sorted by a column by clicking the column heading or by clicking a **Sort** button (⇅) that is displayed in a toolbar that drops down when your mouse hovers over the column heading.



> **Note:** In addition to the **Sort** button, a **Quick Filter** button (▽) is displayed. See **Understanding Quick Filters** on page 27-12 for information.

The **Sort** double arrow button (⇅) is available when the table is not being sorted by that column; once a column is included in a sort, the button will display the current sort direction and clicking it will reverse the sort. Sorting a column will also update the column heading cell to show the sort direction; the sort direction icon is enabled as a button when you hover over it.



> **Note:** Once you sort on a different column, the previous sort column heading updates to remove the sort direction icon.

Sorting by Multiple Columns By Column Selection

If you press the **Shift** key while selecting columns, each column will be included in a sort. The sort hierarchy is based on the selection order, which is indicated by a number next to the sort direction in the column heading cell.

↑1 Start Time	↓2 # Out	↑3 # Still Out
10/05/21 01:06	10	10
10/05/21 04:11	2209	2209
10/05/21 04:47	6	6
10/05/21 05:34	10	10

You can change the sort direction for any of the selected columns by pressing **Shift** and either clicking the sort direction button in the column header or in the drop down toolbar.

> **Note:** If you do not press **Shift**, you multiple column selection will be lost.

Sorting by Multiple Columns Using the Advanced Sorting Options

To display the Columns dialog box with sorting options, right click a column heading, select **Sort** and then **Show Advanced Sort Options...** from the context menu.

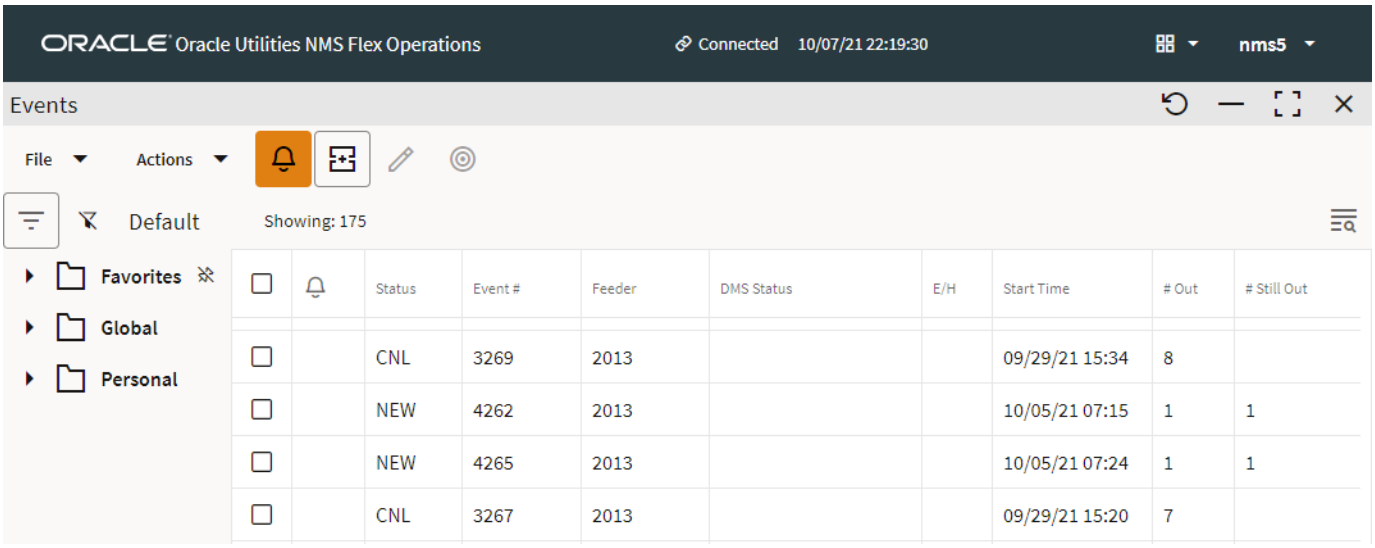
The Columns dialog box displays a list of all columns in the table and will be expanded to show a sort configuration pane. Select the column name and then click the **Add to sorting list** button ( ). Once columns have been added, you may arrange the sort order using the controls below the list or by dragging the column name to the desired spot in the list; see **Changing Column Order and Display** on page 27-7 for information on the Columns dialog box controls. Set the sort type by clicking the button on the left to get the proper sort direction.

Understanding Table Filtering

Creating and Using Global and Personal Filter

Tools with table data may be filtered using filter panes that allow you to access **Global** (system-wide) filters and create and rearrange your own (**Personal**) filters. You may also create shortcuts to your favorite filters. Filtering in Flex Operations is very similar to filtering in the Web Workspace (see **Filtering Data Tables** on page 1-11).

To use an existing filter, click the **Filter** icon ( ) in the upper left corner of the table title area; the Filter pane will open.



The **Filters** pane has collapsible sections (folder icons that expand) that list filters that you have set as **Favorites**, **Global** filters saved by your organization, and **Personal** filters that you have created.

The filter pane will close once you click away from it; to keep it visible, click the pin icon ( ).

Create a New Personal Filter Folder Structure

To create a personal filter folder, right-click the Personal folder icon and select **New Folder...**.

Create a New Personal Filter

To create a personal filter, do the following:

1. Select the **Personal** folder that you want to add the filter to, right-click, and select **New Filter...**.
2. In the New Filter dialog box, enter the criteria for your filter.
    - **Name:** Your new filter's name.
    - **Operator:** The operator for matching data. See **Understanding Operators** on page 1-13 for information.
    - **Value:** Becomes active when you select an operator that requires a value to match.

    Note: See **Filtering Data Tables** on page 1-11 for the operator.
3. Click **Add to List** to add the filter criteria to list below.
4. You can build more criteria and select whether they all should match or if any can match. Click **And** to have the filter only show data that matches all of the added filter criteria; click the **Or** to match a criterion.

Editing and Removing Filters

To edit a filter statement, select it from the list, make your changes, and click **Replace**.

Removing Filters

You can remove any of the added filter statements by selecting it in the list and clicking **Remove**. To remove all of the statements in the list, click **Clear**.

Temporarily Disabling a Filter

Filters may be temporarily disabled by clicking the **Disable Filter** button ( ) next to the filter name. The Filter Name will be updated with strikethrough text to indicate that it is not active. For example, if you've selected **In Progress** to be your filter, but then decide to disable it, the filter bar will indicate so. Click the No Filter button again to restore the filter.

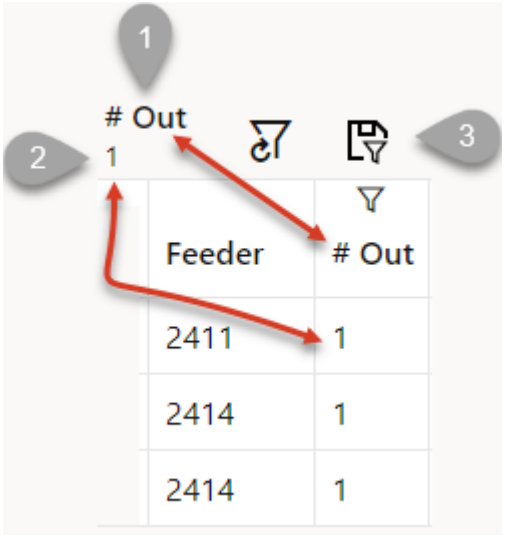
Understanding Quick Filters

Quick Filters allow you to filter based on values in a column. To perform a quick filter, hover your mouse over a column heading and then click the filter button ( ) in the drop down toolbar. In the filter panel that opens, select an item to filter or enter the criteria in the **Search** box. Once you have filtered on a column, the filter icon ( ) will be displayed in the column header and a quick filter breadcrumb will display the filter results and criteria.

To remove the quick filter, click the **Reset All Column Filters** button ( ). The current quick filters can be saved along with the current search folder filters as a new filter in the personal section, by clicking the **Save the Current Filters** button ( ), then providing a name for the new filter. If a folder in the **Personal** filters section is selected, the new filter will be saved there, otherwise it will be saved in the root of the Personal section. The new filter will have a different icon ( ) indicating that there are quick filters associated with it, and when that filter is selected in the tree, the table filtering will be changed to match that saved with the filter.

Example:

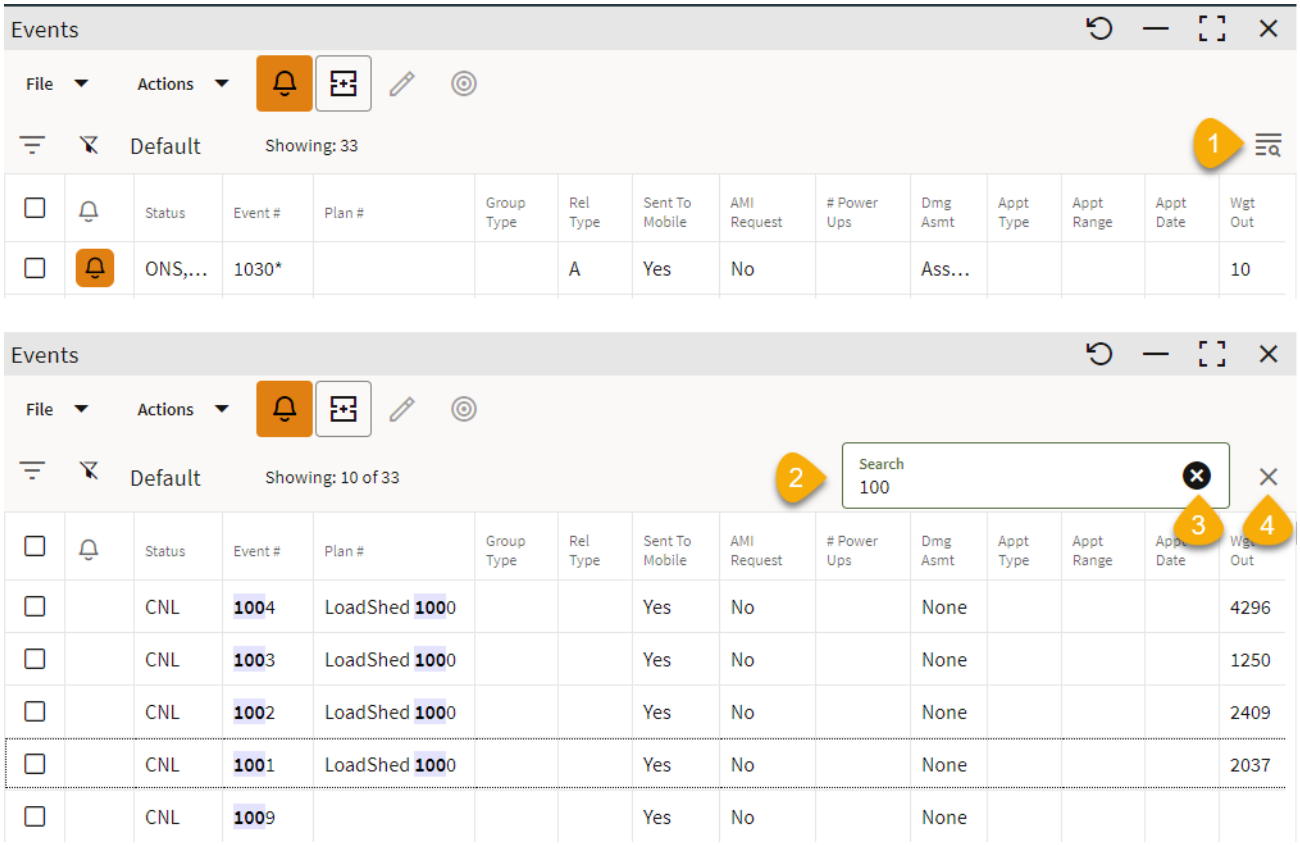
Filtering on the #Out column [1] for a value of 1 [2] with the Save the Current Filters button [3].



Note: Quick filtering is applied to all filtered views, but it is removed when you close the tool or log off.

Understanding Searching in Tables

You can search for data and the table will only show rows matching the search criteria. Any rows containing data that matches the criteria will dynamically highlight the matching text. The searching sequence is as follows:



1. Find and highlight text in any list by clicking the **Search** icon () in the column heading. The **Search** field will be displayed.

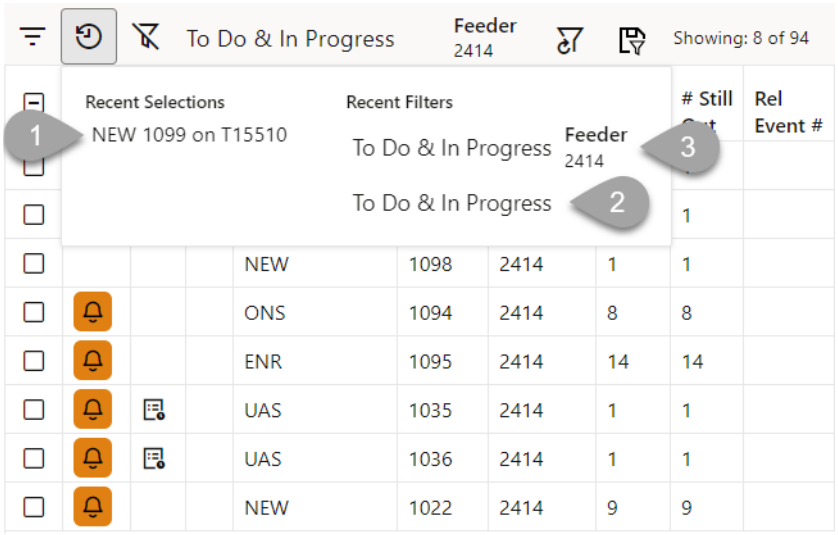
2. Enter your search criteria. As you type, the table will begin to highlight matches and hide any rows that do not contain the criteria.
3. To clear the text entered in the **Search** field, click the **Clear** button ( ).
4. To close the **Search** field, click the **Close** button (×).

Selection and Filter History

The selection and filter history allows you to quickly return to previous filter states or row selections. The **Recent Selections** and **Recent Filters** are listed side-by-side with the most recent selections and filters added to the beginning of the lists.

Example

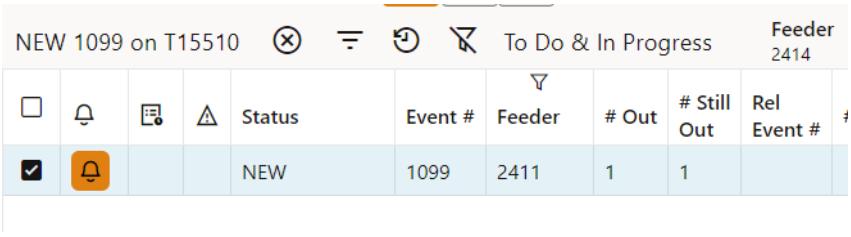
1. Recent Selection
2. Recent Filter of **To Do & In Progress**.
3. Newer Recent Filter that added **Feeder 2414** to the **To Do & In Progress** filter.



When returning to previous row selections, the table will move to a view that shows just those rows, regardless of filtering. The previous view can be restored by clicking the **Return to Normal View** button (⊗) on the toolbar.

Example

Recent selection from the example above selected.



Exporting Table Information

You can export the information displayed in tables in a variety of formats. To display the export options, right click on a table heading and select Export, then choose one of the following options:

Option	Meaning
Selection to Clipboard	Copies the selected items to the Clipboard.
Rows to Clipboard	Copies all rows in the table to the Clipboard.
Selection to Clipboard (With Headings)	Copies the selected rows and the column headings to the Clipboard.
Rows to Clipboard (With Headings)	Copies all table rows, including column headings, to the Clipboard.
Selection as Comma Separated Values	Exports the selected rows, including column headings, as comma separated values in a CSV file. The CSV file is downloaded and displayed in your browser's download area.
Rows as Comma Separated Values	Exports all table rows, including column headings, as comma separated values in a CSV file. The CSV file is downloaded and displayed in your browser's download area.

Note: CSV files can be opened in a spreadsheet application, such as Microsoft Office Excel.

Understanding Other Table Actions

Many tables provide right-click context menus for actions you may perform on the data (for example, viewing an event's information or location in the Map).

In addition, double-clicking a table row may bring up a different tool with related data.

Understanding Printing in Flex Operations

Print menu options are available for lists and detail forms in Flex Operations. Selecting the **Print...** option from a window's **File** menu, opens a print preview dialog box that allows you to print the contents of the page.

Selecting the **Print** option for a details page (for example, from **Event Details** or **Switching Sheet Details**) invokes a Print Options dialog box that allows you to select what to print.

- **Print the current tab**
- **Print selected tabs**

You can select the tabs to print from the list of tabs in the dialog box.

Selecting the **Print Options** dialog box's **OK** button opens a print preview dialog box displaying the content that will be output.

The print preview dialog allows you to print to a printer or save to PDF.

Managing Outage Events

Managing outage events requires interaction between the Events list, Crews list, Event Details, and the Map. The rest of this section explains these tools and provides procedures for performing actions in the Flex Operations client. All of the actions may be performed in the NMS Web Workspace with Switching client and have been described in detail in the relevant chapters (Managing Events with Web Trouble Management, Managing Crews with Web Trouble Management, and Web Switching Management). The focus of this chapter is on taking advantage of the unique features that Flex Operations offers.

Working with the Events and Crews Tool

Events and Crews are displayed together (in a tab view) because of their close association when managing outages.

> **Note:** You can change the relative height of the **Events** and **Crews** panes by dragging the separator bar up or down.

The columns in the **Events** pane and in the **Crews** pane are the same as the Web Workspace Work Agenda and Crew Actions List View, respectively.

- See **Understanding Work Agenda Data Display** on page 2-38 for descriptions of the columns in the **Events** pane.
- See **Understanding the Crew List View** on page 4-6 for descriptions of the columns in the **Crews** pane.
- Common outage management procedures are documented in **Chapter 3**, Managing Events with Web Trouble Management.

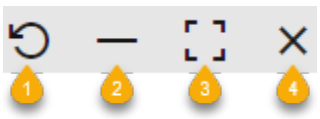
Viewing Events and Crews

The **Events and Crews** tab is displayed by default, but may be closed. If you want to open it again, select **Events and Crews** from the **Tool Selector** ( ). Events, such as outages, are displayed in the **Events** pane; crews are displayed in your **Crews** pane.

> **Notes:**
>
> - You only see events and crews in control zones that you have subscribed to.
> - Right-click an event row to see the actions available for the event.
> - Double-click an event row to view its **Event Details** page.

Understanding the Events and Crews Page Controls

Icons in the Events pane and Crews pane title bars allow you to control the position and display of the panes.



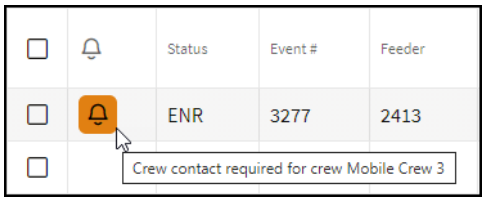
1. **Relative Position (;Events Panel Only):** Click to arrange the Events and Crews panels side-by-side. The icon will update to a clockwise arrow ( ) that, when clicked, will restore the top and bottom layout.
2. **Minimize Pane ( ):** Click to minimize the pane to its title bar, which will maximize the other pane. When a pane is minimized, you can display it temporarily by clicking the title bar. The button will change to a **Restore** button ( ); click the **Restore** button to restore the pane to its previous layout.
3. **Maximize Pane ( ):** Click to maximize the pane, which will minimize the other pane. Alternatively, you can double-click the title bar to maximize it. The button will change to a **Restore** button ( ); click the **Restore** button to restore the pane to its previous layout.
4. **Close Events and Crews Tab ( ):** Click to close the pane.

   Note: These pane controls are also available when viewing a safety document associated with a switching sheet.

Viewing Event Notifications

In the Events List, the Notifications column displays an icon ( ) whenever a new notification related to the event is generated. You may perform the following actions with notifications.

- Mouse over the icon to see the notification text. If more than one notification is associated with the event, each message is displayed on a new line in the tooltip.



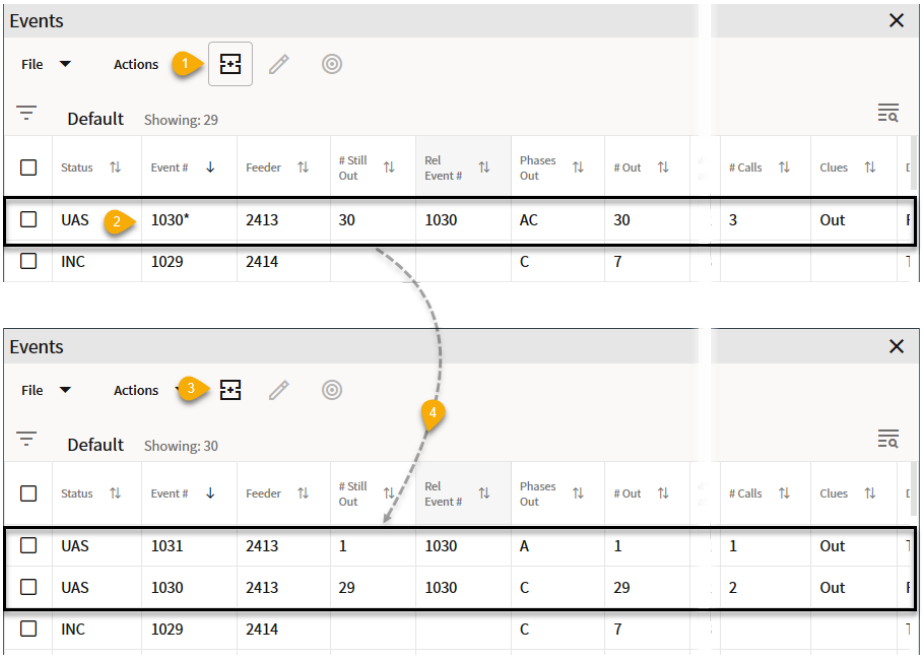
- Clear the notification by right clicking on the row and selecting **Clear Notifications**.
- Click the **Notification** button ( ), which is to the right of the **Actions** menu, to filter on all events in the current filtered view that have uncleared notifications.

Working with the Events Condensed View

The **Condensed View** shows only the lead event among related events. The lead event is displayed with an asterisk (*) following the Event #. Condensed View is activated by clicking the **Condensed View** icon ( ). Once **Condensed View** has been enabled, the icon is displayed inside a box.

In the following example, two events have been related. In the upper half, the Condensed View is enabled (1), only the lead event is shown, and it has an asterisk next to its **Event #** (2). After the Condensed View is toggled off (bottom half), the icon changes to the unselected Condensed View (3), and both events are displayed separately.

In the Condensed View, the lead event summarizes the conditions in all grouped and/or related events. For example, **Phases Out** shows that both the A and C phases are out, but once the related events are shown individually, you can see that Event 1030 is for a C phase outage, while Event 1031 is an A phase outage.



For more information on grouping and relating events, see **Understanding Event Grouping** on page 3-42.

View an Outage Event on the Map

To view the location of an outage event on the Map, select an event then click the **Focus** button ( ). The Map displays as a new tab in your browser, but, if desired, you can detach it and display side-by-side with your **Events and Crews** tool.

When enabled, the Map's **Selection** panel provides the actions available on a selected device.

> **Note:** For information on using the Flex Operations Map see the **Working with the Map** on page 27-29.

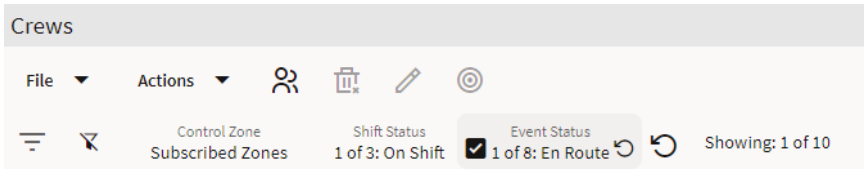
Filtering the Crews List

The **Crews** pane provides filter criteria that you may select to define crews to display. The filter criteria are arranged in groups. Click on each group to display and select the combination of filter criteria you require:

- **Zones**
  - **Zone Filtering Enabled:** When selected, only displays Crews in the zones you are subscribed to. Deselect this option to display Crews for all zones.
  - **Include Crews from Parent Zones:** When selected, includes Crews in zones higher up the Zone hierarchy. (This option is only available when **Zone Filtering Enabled** is selected.

- **Event Zone Filtering:** Only enabled when Zone Filtering is Enabled, displays crews based on the currently selected event(s) in the Event List:
  - **Off:** Does not filter the Crew List based on the currently selected event(s)
  - **Region:** Filters the Crew List based on the region(s) for the currently selected event(s).
  - **Branch:** Filters the Crew List based on the branch(es) for the currently selected event(s).
  - Other levels in the hierarchy may be available.
- **Crew Type**
  - Show Crews Matching Event Work Queues - when selected, filters the Crew Type based on the selected events' Work Queue(s).
- **Shift Status**
  - Filter on a combination of Shift Status(es).
- **Event Status**
  - Filter on a combination of Event Status(es).

Note that as you apply Crew filter options, the filters are summarized in the Filter breadcrumb above the table heading row:

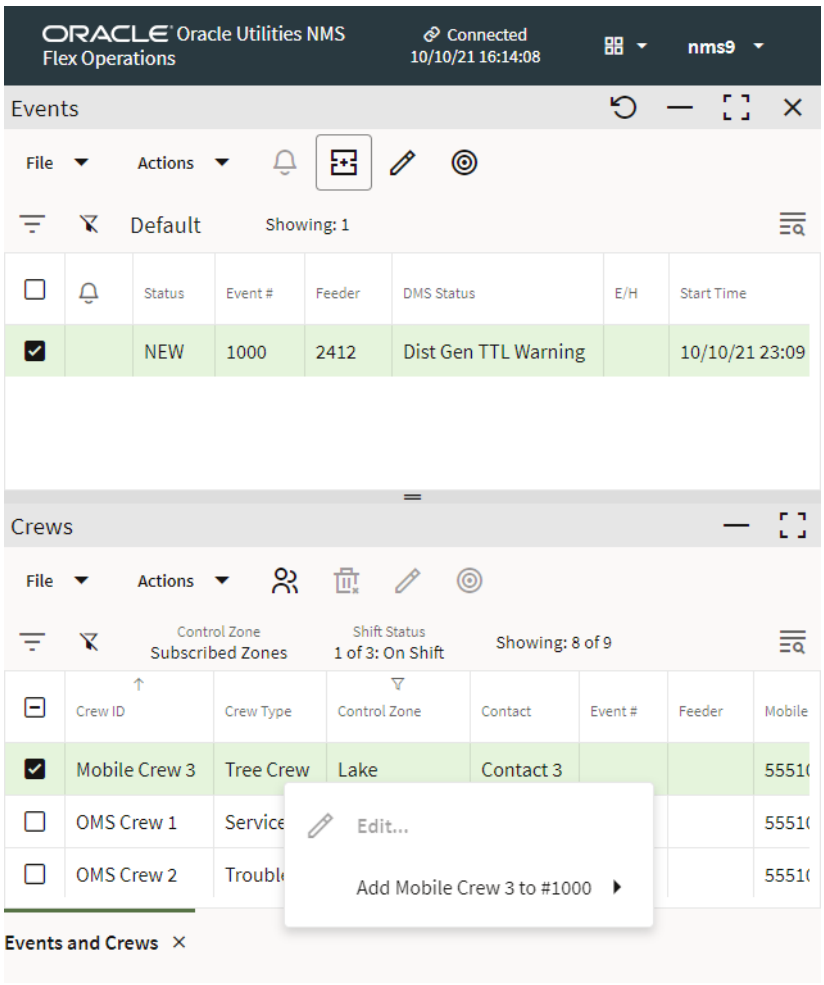


When you hover your mouse over the breadcrumbs, the filter criteria will be highlighted and a selector will allow you to remove that criteria by deselecting.

Assign a Crew to an Event

Crew Assignment is managed in the **Events and Crews** tool.

1. Select an unassigned event in the **Event** pane.
2. Select a crew in the **Crews** pane.
3. Right-click the crew row, and select the option to assign the crew to the event.



Progressing Crew Status

After a crew is assigned to an event, you can record crew status updates:

- Right-click the crew or the event row and click **En Route** ( ) to mark the selected Crew as **En Route**.
- Right-click the crew or the event row and click **Onsite** ( ) to mark the selected crew as onsite

Other Crew Status updates include:

- **Suspend:** Marks the crew as **Suspended**.
- **Off Site:** Marks the crew as **off site**.
- **Availability...:** Allows you to mark the crew as available or unavailable
- **Release:** Removes the crew from the selected event.

Confirming an Outage Event

When the crew arrives onsite, they can confirm the outage device. The system predicts the location of the outage based on customer calls, but sometimes the prediction is incorrect.

When the Prediction is Correct

To confirm the outage from the Events and Crews tool's Events table, do the following:

1. Select the event.
2. Right-click and select **Confirm Outages...** from the **Confirm/Restore Outage** context menu option.
3. In the Confirm Outages dialog box, confirm whether it was a service outage or secondary outage.

To confirm the outage at the predicted location on the Map, do the following:

1. Select the device in the Map.
2. In the Map's Selection panel, choose **Open** from the **Operate** menu.
3. In the Operate Device dialog box, view the conditions, and then click the **Open** [device] button.

Upon opening the device, the event status changes from Predicted to Real/Confirmed.

When the Operated Device is Upstream from the Predicted Device

To confirm a predicted outage is further upstream, you can move the prediction upstream either from the Map or the Event List.

To Repredict Upstream from the Event List

1. Click on the Event and choose **Repredict Upstream**. This extends the predicted extent of the outage to the next protection device upstream.

To Repredict Upstream from the Map

1. Click on the currently predicted device, and then, from the Map's Selection List, select the device you clicked on.
2. Select **Repredict** and then select **Repredict Upstream**. This extends the predicted extent of the outage to the next protection device upstream.

Another option is to navigate the Map to the outage device, and operate that device. Any predicted outages downstream of the device will be subsumed into the confirmed outage you create.

Working with Event Details

The Flex Operations Event Details allows you to view and update event information from a page that is very similar to the Web Workspace Event Details (see **Understanding Event Details** on page 3-1 for more information). It's window has key event information in the top pane and a set of tabs with different types of discrete data for the event below.

Opening Event Details

You can access Event Details from the Events List, Crew List, and Map.

Opening Event Details from the Events List

From the Events List, you can open Event Details for an event by doing any of the following.

- Double-click an event row.
- Select **Edit** from the **Actions** menu.
- Right-click an event row and select **Event Details...** from the context menu.

Opening Event Details from the Crews List

For a crew that is associated with an event, you can right-click the crew row and select **Show Event Details...** from the **Manage [OMS Crew ID] on [Event ID]** context menu option. The **Show Event Details...** option is also available from the Crews List **Actions** menu.

Opening Event Details from the Map

If you have the Map focused on an event, you can select the event symbol and then select **Open Event...** from the Selection pane's **Event** menu.

Understanding Flex Operations Event Details Information Pane

The Event Information pane at the top of Event Details, contains the following information.

- The **Event #** is the number the system has assigned to the event.
- The **Phases Out** is the event phases.
- The **# Calls** is the number of calls for the event.
- **Customers Out** contains the estimated number of customers experiencing an outage for this event.
- The **# Emer.**, **# Med.**, **# Key**, and **# Sens.** list the critical customers affected by the event.
- **Start Date** contains the date and time when the event began. This field is editable except for switching events. For switching events, you must edit the **Completed Date** in the switching step itself. See **Steps Tab** on page 11-28 for more information.
- **Est Restore Date** contains the estimated restore date for the event. You may edit or clear the estimated restore date using standard Date/Time controls (see **Using Date/Time Pickers** on page 1-5 for details).

- **Restore Date** contains the date and time of event restoration (that is, when the outage area was restored). This field is editable except for switching events. For switching events, you must edit the Completed Date in the switching step itself.
- **Est Time to Repair** contains the estimated time to repair the event.
- The **Device** is the name and type of device associated with the event
- The **Sheet #** is the switching sheet number associated with the event, if any. The switching sheet number is prefixed by the switching sheet type.
- **Clues** contains any clues contained in the customer calls.
- **Zone** displays the control zone where the associated device is located.

Understanding Flex Operations Event Details Tabs

Flex Operations Event Details provides many of the tabs available in the Web Workspace. One key difference is that Flex Operations displays tabs for the calls and customer information available through the **Trouble Info** tab in the Web Workspace Event Details.

- **Job Actions:** see **Using the Job Actions Tab** on page 3-4.
- **Completion Actions:** see **Using the Completion Actions Tab** on page 3-7.
- **Equipment Failure:** see **Using the Equipment Failure Tab** on page 3-9.
- **Calls:** see **Using the Trouble Info Callers View** on page 3-14.
- **Customers:** see **Using the Trouble Info Customers View** on page 3-19.
- **AMI Customers:** see **Using the Trouble Info AMI Customers View** on page 3-21.
- **Damage Assessments:** see **Understanding Damage Assessments** on page 27-45.
- **Event Log:** see **Using the Event Log Tab** on page 3-27.
- **Steps:** see **Using the Flex Operations Steps Tab** on page 27-24.
- **Attachments:** see **Working with Attachments** on page 27-25 for details on working with Flex Operations Event Details Attachments.

Updating Outage Events with Flex Operations Event Details

You can record outage updates as information is provided from crews and callers. This ensures that an accurate record of the outage is preserved, and important information can be relayed between callers and crews.

Update the ERT from the Events List

You can update the ERT by selecting the event row and selecting **Update ERT...** from the context menu. Edit the ERT in the **Set ERT** field and click **OK**. Click **Cancel** to close the dialog box without saving changes.

Update Event Dates and Times

Update dates and times in the Event Details summary panel, which is at the top of the Event Details:

- Change the time in the **Est Restore Date** field, then click **Save**.
- Change the time in the **Start Date** field, then click **Save**.
- Change the time in the **Est Time to Repair** field, then click **Save**.
- After an outage is restored, you can edit the **Restore Date**, then click **Save**.

Record Event Notes

1. In the Event Details, click the **Job Actions** tab, if not already in focus.
2. Enter your note in the **Add Event Note** field, then click the **Add** button ( ) to add the note to the event.

Record Completion Actions

As the Crew provides information relating to the cause of the outage, and other pertinent information, you can record this in the event Details.

1. In the Event Details, click the **Completion Actions** tab.
2. From the drop-down lists, select the relevant entries, then click **Save**.

Some fields may be configured to be mandatory before the outage event can be completed. If you attempt to complete an outage event with unpopulated mandatory fields, you will receive a message notifying you that you are missing required fields and then provide a list of those fields.

Record Equipment Failure Information

You can record detailed information about any failed equipment related to an event.

1. In the Event Details, click the Equipment Failure tab.
2. Update the information as required, then click **Save**.

Record and View Damage Assessments

You can view and record Damage Assessments. See **Managing Damage Assessments** on page 27-45 for details.

Using the Flex Operations Steps Tab

The Flex Operations **Steps** tab displays the switching steps that have been recorded and linked to the event. These steps will continue to be displayed in the event's **Steps** tab up until you create an Emergency switching sheet for the event. When an Emergency switching sheet is created, the steps will be moved to that sheet.

When this **Steps** tab is first selected for an event, any steps linked to that event will be pulled from the **Miscellaneous Log** to this **Steps** list.

Steps can be cut/copied from other sheets and pasted into this Steps list; steps can be cut/ copied form this Steps list and pasted into other sheets as well. Steps cannot be cut/ copied from one event's Steps list and pasted into another event's Steps list. For pasting of steps to work, the source tool or sheet has to be loaded. To work around this limitation, the steps can be sent to the Miscellaneous Log and then later cut and pasted into a different event's Steps list.

Steps Tab Toolbar and Context Menus

When the **Steps** tab is selected, additional buttons are displayed in the toolbar and Actions menu for actions that you can perform. If a button is grayed, then that action is not currently permitted.

Most toolbar actions are also available through a context menu that is displayed when you right-click a step row. The context menu contains some options that do not appear on the toolbar.

The **Understanding Steps Tab Actions** on page 3-28 for descriptions of the actions that can be performed on the Steps tab with toolbar buttons, keyboard shortcuts, and/or context menu items with the following exceptions:

1. Actions not available in Flex
    - Clear crews
    - Copy steps as go-back steps
2. Actions only available in Flex Operations:
    - **Clear Clipboard:** Clears copied steps from your computer clipboard.
    - **Edit Step:** Opens Edit Step dialog.
    - **Undo:** Reverts the latest cut, paste, or delete action.

Refer to the **Using the Steps Tab** on page 3-27 for the list of columns available in the Steps table.

Crews List

The Crews List on the event's **Steps** tab functions the same as the Crews List on a switching sheet's **Steps** tab, but only has the **Select Crew...**, **Update Instructed To in Steps**, and **Remove Crew** actions accessible through the context menu. See **Crews List** on page 11-39 for more details.

Working with Attachments

The Event Details **Attachments** tab allows you to work with files that are relevant to the event.

Adding Event Details Attachments

1. To add an attachment, select the Event Details **Attachments** tab.
2. Click the **Add Attachment** button ( ) on the toolbar (or you may select the option from the **Actions** menu).
3. Drag and drop a file to the Attachment dialog box.
4. You may, optionally, add a URL and/or description of the file.

Editing Event Details Attachments

1. To edit an attachment, select the attachment row in the **Attachments** tab.
2. Right-click and select **Edit Attachment**.
3. In the Attachment dialog box, you can change the data in any of the fields and/or replace the file with a new version, as necessary.

Removing Event Details Attachments

1. To remove an attachment, select the attachment row in the **Attachments** tab.
2. Right-click and select **Remove Attachment**. The attachment will be deleted and the attachment row removed from the Attachments table.

Downloading Event Details Attachments

1. To download an attachment, select the attachment row in the **Attachments** tab.
2. Right-click and click **Download Attachment**; alternatively, you may double-click the row and the file will download. The file will be saved to your browser's default download folder.

Working with Events in Flex Operations

Restoring an Outage Event

When the Crew reports they have restored supply, you can record this from the Event List or from the Map.

To restore an outage:

- In the Event List, right-click on the event, and select **View on Map...**.
- From the Map, click to select the device, then from the **Selection Panel**:
  - Select **Close** from the **Operate** menu.
  - View the information in the Look Ahead dialog box, then **Close** the device.

Upon closing the device, the event status changes from *Real/Confirmed* to *Restored*.

Updating Multiple Outage Events

You can update multiple outage events at the same time. Specifically, for a selected group of outage events you can:

- Update the Estimated Restore Time
- Record a note
- Update Completion Actions

To do this:

1. In the Event List, click to select the outage events you wish to update.
2. From the **Actions** menu, select **Update Events**.
3. In the Update Events dialog box, enter the updates, and then click **Update**.

Completing Outage Events

You can complete an outage when:

- All customers have been restored.
- All mandatory fields are populated.

To complete an outage, in the Event Details, click the **Complete** button ( ).

See **Using the Completion Actions Tab** on page 3-7 for more information on the fields and requirements for completing an outage event.

Creating a New Event

You can create a new event on a device or conductor.

1. In the **Map**, select a device or conductor
2. From the Selection Panel's Event menu, select **Create Event** ( ) to display the **Create Event for Device** dialog box.
3. Enter the information, then click **OK**.

For more information on creating events, see **Creating an Event** on page 2-29.

Managing Crews in Flex Operations

Flex Operations allows you to:

- Assign crews to outage events.
- Record crew status updates.
- Add, edit, and delete crews.

Assigning Crews to Outage Events

Crew Assignment is managed in the **Events and Crews** tool and from certain context menus in the **Map**.

To assign a crew to an outage event

1. In the Crew List, click to select a Crew.
2. Click to assign the crew to the event. You can also right-click to reveal crew assignment context menu options.

To assign a crew to multiple outage events

1. In the Event List select the outage events by one of the following methods:
    - Press and hold the **Ctrl** key and click to select the event rows.
    - Select the applicable event row check boxes.
2. In the Crew List, click to select a crew.
3. Right-click to reveal valid crew assignment options.

To assign multiple crews to an outage

1. In the Crew List select the Crews by one of the following methods:
    - Hold the **Ctrl** key and click to select the crews.
    - Select the applicable crew row check boxes.
2. In the Event List, click to select the Event.
3. Right-click to reveal valid crew assignment options.

Progressing and Modifying Crew Status

Progressing Crew Status

Once a crew is assigned to an outage event, you can progress its status.

> **Note:** You can update the crew status from the Event List, the Crew List, the crew symbol in the Map, or from the Event Details **Job Actions** tab.

1. Right-click the event or crew.
2. From the context menu, select the appropriate option from the **Manage Crew [Name] on Event [#]** options:
   - **En Route:** Places the crew en route to the event.
   - **Onsite:** Places the crew onsite at the event location.
   - **Offsite:** Places the crew offsite and sets their status back to En Route.
   - **Suspend:** Suspends a crew from its active event. Once a crew is suspended from an event, they can be placed **En Route** to another assignment.
   - **Release:** Removes the crew from its current assignment.

The only time that an event and a crew must both be selected is when initially assigning a crew to an event. From an event in the **Events** pane or the event symbol on the Map, you can update the status of any crew currently assigned to that event. A submenu will be shown for each crew currently assigned to that event. Similarly, from a Crew in the **Crews** pane or a Crew symbol on the Map, you can update the status of that crew on any event that the crew is currently assigned to. A submenu will be shown for each event that the Crew is currently assigned to.

Place a Crew On Shift or Off Shift

1. Select the crew.
2. From the **Actions** menu, select **Set Off Shift...** or **Set On Shift...**.
3. Enter a time, then click **Done**, and then click **OK**.

Creating, Editing, and Deleting Crews

As a Flex Operations user, you can create, edit, and delete crews.

Creating a Crew

1. From the Crew List, select the **File** menu and then select **New**.
2. In the Crew Makeup dialog box, enter the crew's information, and then click **OK**.

The information displayed in the Crew Makeup dialog is the same as in the NMS Crew Makeup dialog; see **Using Crew Makeup** on page 4-11 for more information.

Editing Crew Details

1. In the Crew List, slick to select a crew.
2. Click **Edit** to open the Crew Makeup dialog.
3. Make your changes, then click **OK**.

Deleting a Crew

1. Select the crew and ensure it is not assigned to any events.
2. Click **Delete**.

Working with the Map

The Map provides an operational, interactive, real-time view of the distribution network. It provides context, improves situational awareness, and allows you to update the network directly.

As a Flex Operations user, you can interact with the Map to understand the current network state and assist in the outage management process. You can:

- Visualize and manage outages.
- View information about network assets like switches, conductors, and customers.
- Record device operations.
- Annotate the Map with notes and device tags.
- Add Damage Reports.
- Record Patrolling updates.
- Print the map..

See **Selecting and Interacting with Map Objects using the Selection Panel** on page 27-38 for more information.

Displaying the Map

By default, the Map is displayed as a new tab in your browser. You can tear off the tab and display it as a standalone window if required. This enables you to display the map and the Events and Crews side by side, if required.

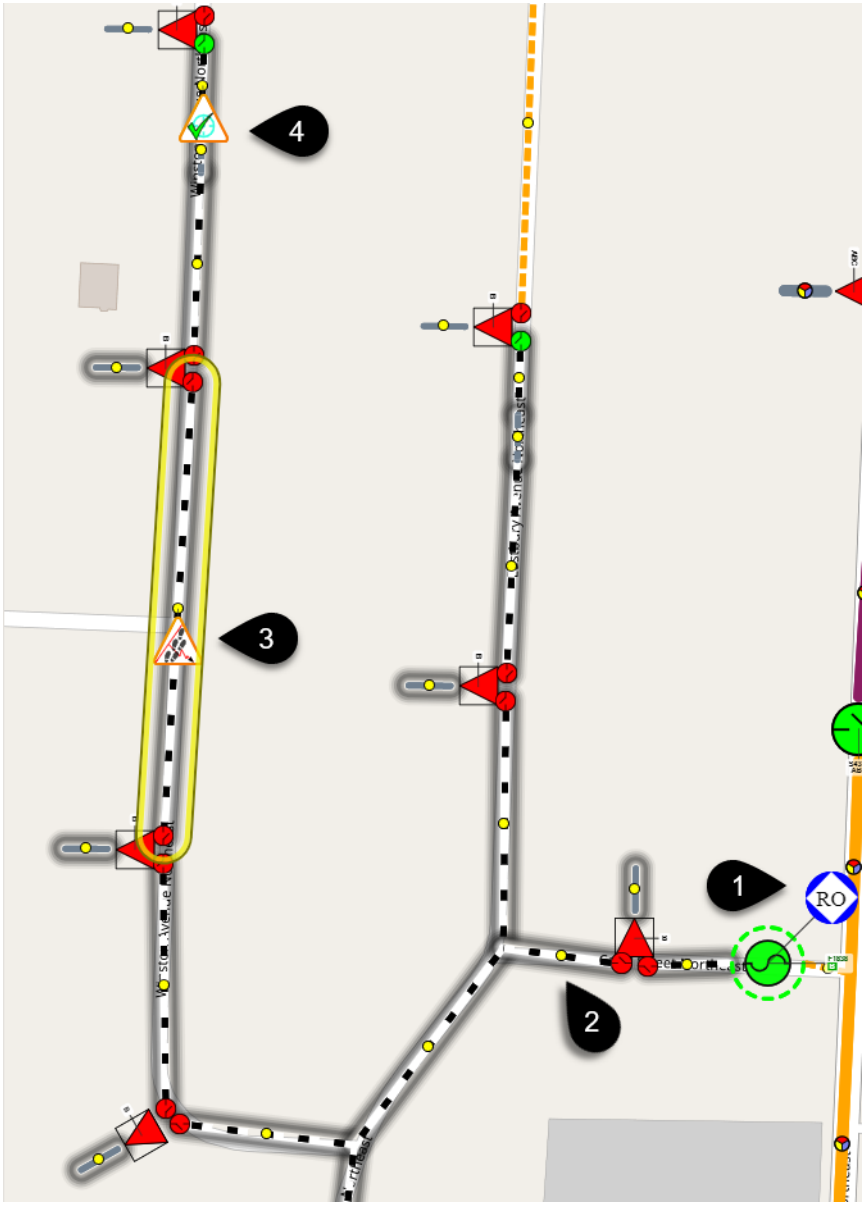
To display the Map:

- From the Workspace Tool Selector, select **Map**.
- To view the location of an outage event on the Map, select an event then click the **Focus** button ().

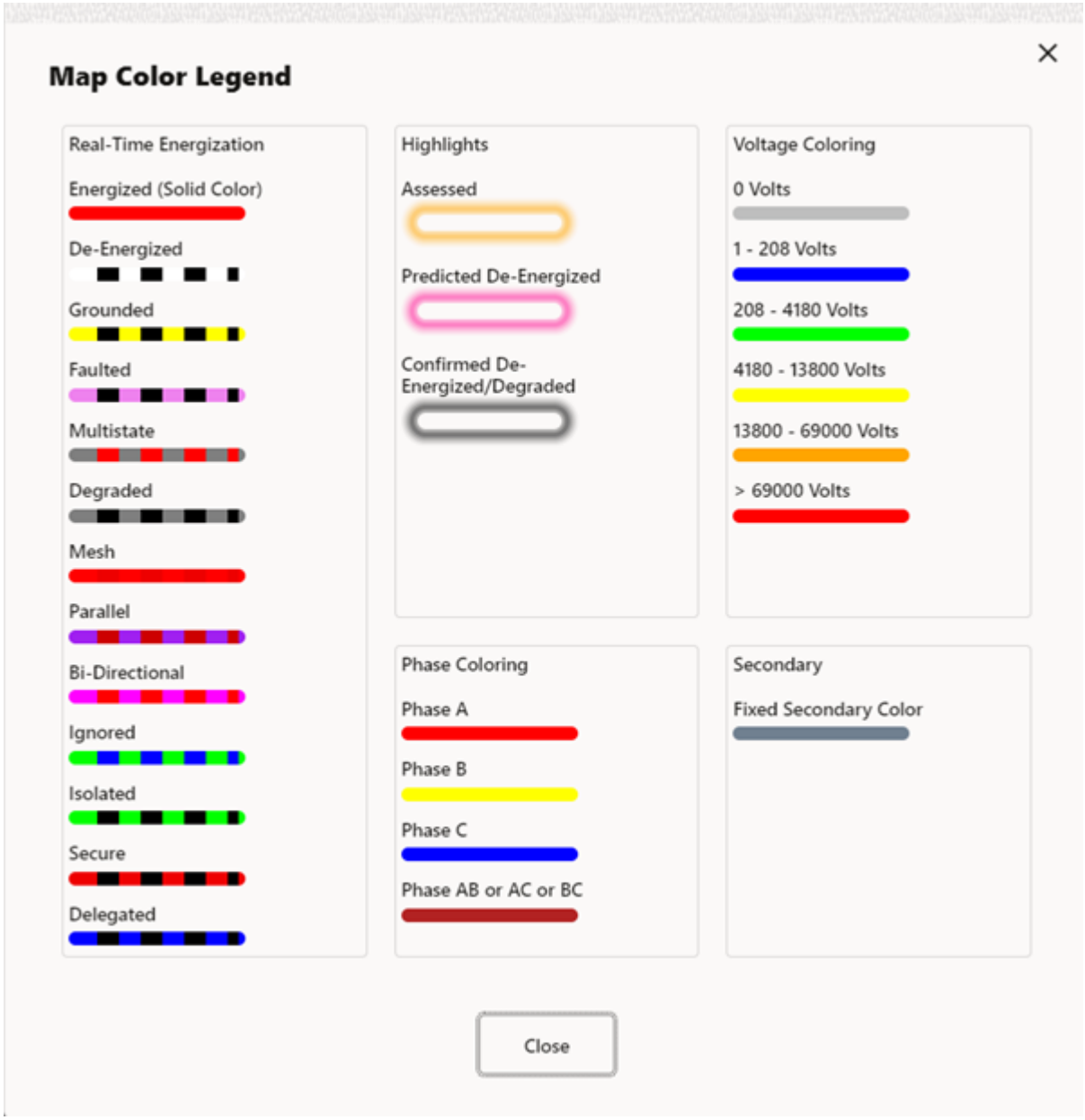
  Note: The Map displays in a new browser tab, but, if desired, you can drag the browser tab outside of the browser window to display the **Map** side-by-side with your **Events and Crews** tool.

The Map provides visual cues and symbols to represent devices, events, and conditions.

For example, the following screen capture depicts [1] an abnormally open switch with a real outage (RO symbol), [2] the resulting de-energized section of the network, [3] a highlighted segment with a Patrolling symbol, and [4] a device patrolled symbol.



You can view conductor and condition coloring settings by selecting the **Map Color Legend...** from the Map's **View** menu.


Map Color Legend
Real-Time Energization
Energized (Solid Color)
De-Energized
Grounded
Faulted
Multistate
Degraded
Mesh
Parallel
Bi-Directional
Ignored
Isolated
Secure
Delegated
Highlights
Assessed
Predicted De-Energized
Confirmed De-Energized/Degraded
Voltage Coloring
0 Volts
1 - 208 Volts
208 - 4180 Volts
4180 - 13800 Volts
13800 - 69000 Volts
> 69000 Volts
Phase Coloring
Phase A
Phase B
Phase C
Phase AB or AC or BC
Secondary
Fixed Secondary Color
Close

Understanding Map Settings

To display the **Settings** panel, click the gear button . Options here enable you to change visualization and behavior of the Map. Note that the Map updates as you adjust them. Some options may have assigned shortcuts:

- **Landbase Source:** Enables you to select different landbases.
- **Landbase Opacity:** Select the visual intensity of the landbase.
- **Map Theme:** The Map theme can be changed to support low-lit or well-lit working environments. The following options are available:
  - **Automatic (Follow Theme):** Inherits the Light or Dark theme selected in the main Flex Operations Settings panel.
  - Dark: Displays the dark Map theme regardless of the currently applied Flex Operations theme.
  - Light: Displays the light Map theme regardless of the currently applied Flex Operations theme
- **Symbol Scale:** Select the preferred symbol size/scale (applies to devices and symbols)
- **Big Symbols:** When selected displays preconfigured symbols larger when zoomed out.
- **Big Symbol Scale:** Select the scale of big symbols, when they are displayed.
- **Line Scale:** Select the thickness of conductors.
- **Text Scale:** Select the size of text displayed in labels
- **Condition Distance Scale:** Select the distance at which conditions and outage symbols display from their associated device.
- **Conductor Highlight Blur:** Display conductor highlighting with sharp edges, or with blurred edges.
- **Conductor Highlight Opacity:** Select the intensity/opacity of the highlighting.
- **Conductor Highlighting Scale:** Select the thickness of conductor highlighting.
- **Trace Outline Opacity:** Select the intensity/opacity of traces.
- **Trace Outline Scale:** Select the thickness of traces.
- **Feeder Highlight Opacity:** Select the opacity/intensity of non-selected feeders, when Feeder Highlighting is applied.
- **Conductor Dashing Mode:** Conductor line styles can be applied to indicate phasing or overhead/underground
  - **Underground Cables:** Display underground conductors with dashed lines.
  - **Phase Count Dashes:** Display number of phases as dashes.
  - **None:** Do not display underground cable dashing or phase count dashes.
- **Rotate Device Symbols:** Display device symbols in the same orientation or aligned with the network.
- **Device Labels Always to the Right:** When selected, displays device labels to the right of the device.

- **Show Selection Panel when Item is Selected:** When selected, displays the Selection panel for the device. (When deselected the panel is not shown by default, but can be shown by clicking on the Map toolbar or by selecting the same option from the selected device's right click menu).
- **Do Not Move Map When Panels Open:** When selected, as Map panels are displayed the Map does not move to accommodate the panel.
- **Inertial Panning:** When selected, the Map exhibits "momentum" after panning with the mouse or finger.
- **Smoothly Animate Between Positions:** When selected, the Map smoothly pans and zooms between different positions; for example when clicking Back or Forward, when targeting on nearby events, or displaying the extent of a trace.
- **Auto-reset to Default Selection Mode:** When selected, returns to the default Map selection mode. (For example, after switching to Measure Distance mode or Geographic Location mode)

After changing settings in this panel, click **OK** to apply the changes, or click Defaults to restore the factory settings.

The changes you apply here will be saved with your **User Preferences** the next time you log on.

Understanding Pan and Zoom Actions

Pan and zoom uses the same technique as many other widely available online Map applications.

- To pan the Map, click and hold the left mouse button, then drag the mouse pointer to a new position.
- To zoom the Map, roll the mouse wheel away from you to zoom in or toward you to zoom out.
- To zoom to show an area of the map, click and hold the middle mouse button, then drag to define the area you wish to view, then release the mouse button. This will zoom in and pan to center the area at the highest zoom possible that can show the requested area of the map.

When using on a touch enabled device, use your finger to pan the map and the pinch gesture to zoom in or out.

Understanding Common Symbols

Symbols commonly displayed in Flex Operations provide additional situational awareness. The following list describes some symbols you may see in the Map.

- **Outage Symbols** represent the predicted or confirmed location of devices that have operated. They are automatically removed when the outage is restored.
- **Crew Symbols** show the intended location of Crews. Crew symbols are displayed when the crew is en route or onsite at an outage event, and removed when the crew is released.
- **Call Symbols** show the location of customers who have called to report an outage. They are automatically removed when the outage is restored.
- **Notes** are used to annotate network assets, or can be placed on the Map background.
- **Tags** can be added and removed by suitably authorized Users.
- **Damage Assessments** and **Patrolling Conditions** can also be added and removed by suitably authorized users.

Map Menu Options

File Menu

The **File** menu allows you to print the map view or close the map tab/window.

- **Print**

  The **Print** option allows you to print the Map with what devices and conditions are currently visible (using the current Hide/Display options).

  - Select **Print** from the Map's **File** menu. The map area will be displayed in preview mode. You can pan and zoom in the Print Preview view to change the area of the map to print.

    Click the **Print Selected Region** button (🖶) to view the Print view where you can select a printer to print to or save as a PDF.

    To cancel without printing, click the **Cancel Print** button (⊗).

- **Exit:** Closes the Map window

View Menu

Options available here provide different views of the electrical network:

- **Color by Feeder:** When selected, colors the network feeder by feeder.
- **Color by Phase:** When selected, colors the network by phase.
- **Color by Nominal Voltage:** When selected, colors the network by nominal voltage.
- **Color Secondary by Fixed Color:** When selected, all secondary network will show with the configured fixed secondary color.

- **Color Secondary by State:** When selected, secondary networks that have state related styles will be styled according to the state. Any secondary network that is in a nominal state will show the configured fixed secondary color.
- **Color Secondary by State and Mode:** Similar to the **Color Secondary by State** option, but the nominal state conductors will follow the Feeder/Phase/Voltage coloring mode, just like non-secondary conductors.
- **Show Nominal Network State:** When selected, displays the nominal state of devices and conductors.
- **Declutter Symbols:** When selected, declutters the network when zoomed out.
- **Map Color Legend:** Displays the Map Color Legend dialog, which illustrates the colors, highlights, and line styles for the different electrical states, phases, and voltages.
- **Show Diagnostics Panel:** Displays a panel allowing access to Map configuration and analysis (not displayed for most User types).

Map Hide/Display Options

The Hide/Display menu allows you to select what devices or map components to show or hide. The options are:

- **Hide / Display**
  - **Landbase:** Toggle the visibility of the landbase (if one is selected in the **Settings** panel).
  - **Secondary:** Toggles the visibility of the secondary network
  - **Structures:** Toggles the visibility of structures such as poles
  - **Non-Main Asset DA:** Toggles the visibility of non-main asset damage report symbols.
  - **Customer Calls:** Toggles the visibility of customer calls.
- **Annotations**
  - **Conductor Current Phase Markers:** Toggles the visibility of phase indicators on conductors.
  - **Device Labels:** Toggles the visibility of device labels
  - **Device Nominal Phase Labels:** Toggles the visibility of devices' nominal phase(s). If a device is in an abnormal state the background of the label is colored green (abnormally open) or red (abnormally closed).
  - **Conductor Nominal Phase Labels:** Toggles the visibility of conductors' nominal phase(s). If a conductor is in an abnormal state the background of the label is colored green (abnormally de-energized) or red (abnormally energized).
  - **Conductor Feeder Labels:** Toggles the visibility of conductor feeder labels.
  - **Flow Direction:** Toggles the visibility of flow direction arrows.
- **Crews Types**
  - All
  - Line

- Trouble
- Guide
- Service
- Eval
- Tree Crew

- **Conductor Highlight**
  - Assessed
  - Predicted De-Energized
  - Confirmed De-Energized
  - Confirmed Degraded

See **Hiding and Displaying Viewer Objects** on page 2-79 for more information.

Using the Map's Back and Forward Buttons

The map toolbar **Back** (⇦) and **Forward** (⇨) buttons allow you to go back or forward to recently viewed positions on the map. The history is stored whenever the Map is stationary for a couple of seconds. Up to 50 map positions can be stored in history.

When smooth animation between positions is enabled, there may be some occasions where you want to skip the animation and proceed directly to the target. Selecting the skip animation option (⏩) performs that action.

> **Note:** Alternatively, to skip the animation, you can press **G** on your keyboard.

Searching and Positioning

You can search on assets, customers, and other type of map object.

1. Click the **Search** button (🔍) to open the Map Search dialog box.
2. Choose the **Search Type** from the drop-down list.
3. Enter the text to search for.
4. Select a wildcard option, if applicable.
5. Click the 🔍 **Search** button to execute the search:
   - If there is only one match, the dialog box will close and the Map will reposition.
   - If there are multiple matches, they will be displayed in the Search Results panel that is displayed below the map. If the search result exactly matched the entered text, it will be highlighted and positioned automatically.

Using the Distance Measurement Tool

You can measure distances on the Map:

1. In the Map toolbar, click the measurement tool (📏).

2. Click in the map to add a start position.
3. Move to a different position and click again to create a turning point.
4. Double-click or click on the last point to complete the measurement. The distance is displayed in the top-right corner of the Map.
5. Click anywhere in the Map to remove the measurement.

Using the Geographic Location Tool

You can click on a map location to get the geographic co-ordinates:

1. In the Map toolbar, click .
2. Click in the Map at the desired location. The geographic co-ordinates are displayed in the top-right corner of the Map.
3. If required, copy the co-ordinates to the clipboard.
4. Click anywhere in the Map to remove the co-ordinates.

Displaying Tooltips

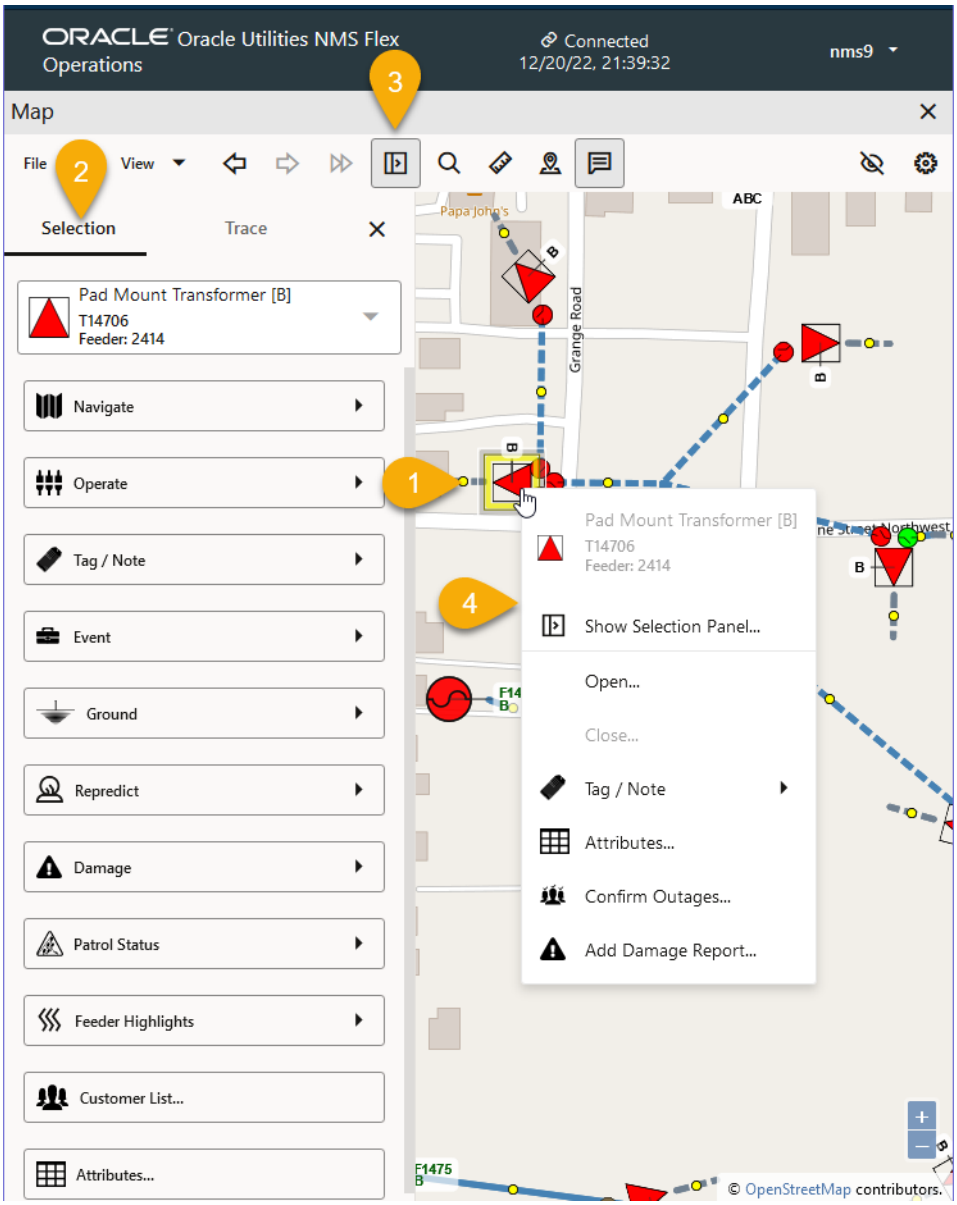
You can display hover-over tooltips:

1. In the Map toolbar, click .
2. Mouse over a device, conductor, or symbol to reveal more information.

To keep the tooltip displayed, move the mouse pointer over the tooltip while it is still displayed. The information displayed depends on the type of object.

Selecting and Interacting with Map Objects using the Selection Panel

When you select a device or symbol, it will be highlighted or outlined in yellow [1]. The **Selection Panel** will be displayed [2] when the **Selection Panel** icon is toggled on [3]. Device operations are available through right-click context menus [4].



The Selection Panel is a combination tool providing actions and information that are found in multiple tools in the NMS operations client (for example, the Control Tool).

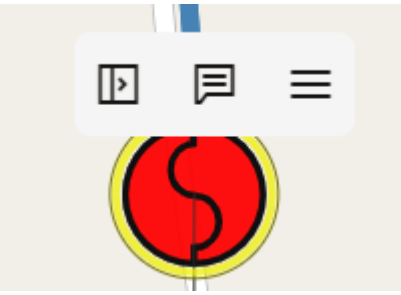
Get Directions or Access Other Map Views

The **Navigate** menu allows you to select from options based on the object selected.

- **Directions to Location** opens a navigation site (in a new browser tab) to get directions to the object's location.
- **Cycle Available Geographic and Internal Map Views** cycles through different views of the device (schematics, geographic, and so forth).
- **View Full Extent** zooms out to show the device in relation to its network.
- **View in Geographic Map** changes the Map to the geographic view.
- **View Schematic Map** changes the Map to the schematic view.
- **View Single-Feeder Map** changes the Map to show the feeder one line view.

Note: When using Flex Operations on a touchscreen, tap on a device to display a popup menu which enables you to:

- Display the selection panel
- View the device's tooltip
- Display the device's right-click menu



Understanding Crew Management Features in the Map

For a selected event or crew, the right-click context menus provide the available options for managing the crews. For a selected event, options will only be available to manage crews associated with that event. Similarly for a selected crew, options will only be available to manage the crew on events that it is already associated with.

Setting Outages as Stable or Not Stable

Predicted outages can be marked as stable or not using these menu options on the event context menu. For a detailed description of the event stable functionality, see **Working with Stable Predictions** on page 3-49.

Repredicting Upstream / Downstream

Options to repredict the location of an event are available when applicable to the currently selected event. For a more detailed description of these options, see **Repredicting Upstream/Downstream** on page 2-121.

Viewing Downstream/Connected Customers

Click the **Customer List...** button to view a list of customers downstream of the selected device.

Creating a New Event on a Device or Conductor

You can create a new event on a device or conductor.

1. For the selected object, select **Create Event** from the **Event** menu. The **New Event** dialog box will open.
2. Enter the new event information, then click **OK**.

See **Creating an Event** on page 2-29 for more information.

Working with Notes

You can annotate, add, edit, and delete notes on the Map.

Adding a Note

1. With a device or conductor selected, select **Add Note** from the Selection Panel's **Tag/Note** menu.
2. Enter the text and then click **OK**.

Editing a Note

1. In the Map, select the **Note** symbol, then from the Selection Panel, select **Edit** from the **Tag/Note** menu.
2. Edit the text, then click **OK**.

Deleting a Note

In the Map, select the **Note** symbol, then from the Selection Panel, select **Remove** from the **Tag/Note** menu.

Working with Tags

You can annotate add, edit, and remove device tags on the Map.

For more information about tagging devices, see **Tagging Devices** on page 2-110.

To add a tag:

1. In the Map, click to select a device or conductor, then from the **Selection Panel** select **Add Tag** from the **Tag/Note** menu.
2. Choose the tag type, if prompted, enter tag text, if applicable, and then click **Instruct** or **Complete**. The tag is added.

Editing a Tag

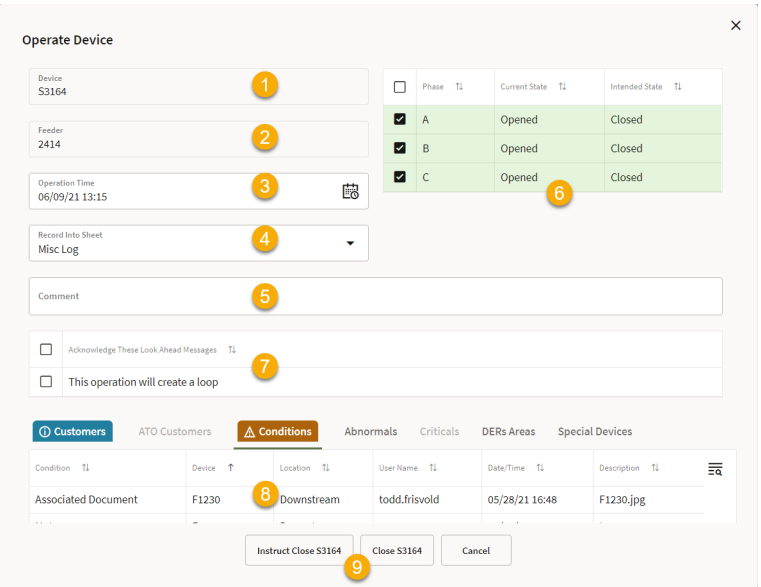
1. In the Map, select the tag symbol, then from the **Selection Panel** Tag panel, select **Edit Condition** from the **Tag/Note** menu.
2. Edit the text, then click **OK**.

Removing a Tag

In the Map, click to select the tag symbol, then from the **Selection Panel** Tag panel, select **Remove Condition** from the **Tag/Note** menu.

Operating Devices

The Operate Device dialog box is displayed when instructing or completing device operations; it allows you to verify important information before instructing or completing the device operation. It can be displayed from the Map or from a switching sheet.



As illustrated in the screen capture above, the Operate Device dialog box has the following fields and buttons.

1. The **Device** to be operated.
2. The **Feeder** for the device to be operated.
3. The **Operation Time** recorded. Default to the current time, but can be backdated if required, to allow for more accurate recording of time off / time restored.
4. The **Record Into Sheet** field allows you to choose where the device operation will be recorded. If you are recording into a switch sheet, you can still choose to record the operation into the Miscellaneous Log, if required.
5. The **Comment** field allows you to add a comment to the device operation. This will be seen in the Comment field in the switching step for the device operation in the switching sheet or Miscellaneous Log.
6. The **Phases** table allows you to select the phase(s) to be operated. All available phases are selected by default, but can be deselected by clicking the check boxes. Clicking anywhere else on a phase row selects that row and deselects other rows.
7. The **Look Ahead Messages** section displays safety or electrical information messages. For example, warns you that you are going to make or break a loop, or energize a grounded section. These messages must be acknowledged/checked before the command buttons (for example, **Instruct Close [Device]**) become enabled.
8. The tabbed **Look Ahead** section provides information relevant to the impending device operation. Some information can be configured such that it must be viewed

before operating the device. In cases like this, the tab with the information will oscillate until selected; once the tab has been selected and the page viewed, the command buttons become enabled.

9. Command buttons allow you to instruct or complete the device operation. These buttons will only become enabled once any electrical look ahead messages and conditions have been acknowledged.

You can operate devices as described below.

1. From the Map, select the device, then from the **Selection Panel**, select **Open** or **Close**, as applicable, from the **Operate** menu.

   Note: The Operate Device dialog box will be displayed when executing switching sheet steps.

2. In the Operate Device dialog box, enter information as desired in the top panel. Things you may edit include the phases to be operated, where to record the action to (Miscellaneous Log or a switching sheet), and comments.
3. In the lower part of the Operate Device dialog box, view **Look Ahead** information. If the action results in conditions that need to be acknowledged, the **Conditions** tab will jiggle. Select the **Conditions** tab and view the results of the operation.

   Note: For more information see **Understanding the Look Ahead Dialog Box** on page 2-124.

4. Once you have reviewed the information, click the **Open** or **Close** button, as applicable, to complete the operation.

In the Map, the device and network update to reflect the change in state.

Adding Damage Reports

1. In the Map, click to select a device or conductor, then from the **Selection Panel**, select **Add Damage Report...** from the **Damage** menu.
2. The new Damage Assessment is displayed in a tab in the Workspace.

Record Patrolling Updates

You can add and update patrolling conditions.

Adding a Patrolling Condition

1. In the Map, click to select a device or conductor.
2. From the **Selection Panel**, select **Patrol Status**, and then select the type of patrol condition to add:

   - **Add Patrolling Condition:** Adds the condition in a *Patrolling* state.
   - **Add Device Patrolled:** Adds the patrolling condition of *Device OK*.
   - **Network Patrolled:** Adds the patrolling condition to *All OK*. Highlights all network downstream of the selected device in a patrolled color.

Updating the Status of a Patrolling Condition

1. In the Map, select the patrolling symbol.
2. From the **Selection Panel** Patrolling panel, select **Edit Condition** from the **Tag/Note** menu.
3. In the Patrolling Condition Details dialog box, change the condition status and add a description in the **Text** field, then click **OK**.

Removing a Patrolling Condition

1. In the Map, click to select a patrolling symbol.
2. From the **Selection Panel** Patrolling panel, select **Remove Condition** from the **Tag/Note** menu.

Feeder Highlights

You can highlight an entire feeder by hiding/subduing the other feeders.

For a selected device or conductor, click **Feeder Highlights** ( ) then click Highlight Feeder. Other feeders will be displayed less prominently, but still be selectable (so you can highlight additional feeders).

To remove or clear feeder highlighting, click to select the feeder then choose Unhighlight or Clear Highlighting. You can also clear highlighting from the Highlighting indicator displayed in the top-right of the Map.

Viewing Downstream/Connected Customers

Click the **Customer List...** button to view a list of customers downstream of the selected device.

Examining Network Devices, Assets, and Symbols

To find out more about an asset or symbol, select it and then click the **Attributes** button from the **Selection Panel**.

Using the Trace Feature

The Trace tab enables you to perform traces:

1. Click to select a network asset like a device or conductor.
2. In the Trace To box, select the trace stop class.
3. Choose the Direction to trace.
4. Choose the Phase(s) to trace.
5. Click to perform the trace.

After a trace has been performed you can perform the following actions:

- **Clear** ( ) the trace as displayed on the Map
- **Refresh** ( ) the trace
- **Target** ( ) the trace, to the Extent of the trace, or on the Start Point
- **View** ( )the Trace Results. Trace results are displayed in a panel, and for each result you can right-click to position on the object, or fetch calculated values.

A list of recent traces is displayed, and actions can be performed on each trace in the list. See **Executing Traces** on page 2-84 for more information on trace options.

Managing Damage Assessments

Flex Operations users can create and update damage assessments.

Understanding Damage Assessments

Damage assessments are associated with events and can be viewed and edited in Flex Operations.

Each damage assessment has editable information, including the ability to enter crew information, add information about damaged assets, and attach images.

To view a list of damage assessments associated with an outage event:

1. In the Event Details, select the **Damage Assessment** tab.
2. In the Damage Assessment List, right click on a damage assessment and select **Open Damage Assessment**. The damage assessment is displayed in a new tab.

Damage Assessment Procedures

Creating and Editing Damage Assessments

1. In the Event Details, select the **Damage Assessment** tab.
2. Select + **New Damage Assessment**. The new Damage Assessment will open in a new tab.
3. Edit the details:
    - In the upper panel, edit crew and reported date information.
    - In the **Damaged Assets** tab, add a new damaged asset, or select a damaged asset from the list and edit it. (You can also delete a damaged asset item.)
    - In the **Damage Specifics** tab, edit the number of crews, and other related information.
    - In the **Attachments** tab, you can add, edit, or delete attachments.
        - **Add an Attachment**
            - Click the **Add Attachment** button () on the toolbar.
            - Drag and drop a file to the Attachment dialog box.
            - You may, optionally, add a URL and/or description of the file.
        - **Edit an Attachment**
            - Select the attachment row, right-click and select **Edit Attachment**.
            - In the Attachment dialog box, you can change the data in any of the fields and/or replace the file with a new version, as necessary.
        - **Delete an Attachment**
            - Select the attachment row, click the **Delete selected attachment** button in the first column.

Progress the State of a Damage Assessment

The state of a damage assessment is displayed in the **State** field in the top panel. This can be progressed by the mobile-enabled user, or you can progress the state by selecting one of the following options from the **Actions** menu:

- Assessing
- Assessed
- Standing By
- Fixed
- Obsolete

For more information about Damage Assessments, see **Working with Damage Assessments** on page 3-50.

Working with AMI Requests

Displaying the AMI Requests List

To display the AMI Requests list, select AMI Requests option from the Tool Selector menu.

> **Note:** The AMI Requests list only displays manually generated AMI requests.

For the more information on fields and buttons available in the AMI Requests list see **Displaying the AMI Requests List** on page 3-57.

Creating AMI Requests

Creating AMI Requests for Existing Outage

To create an AMI request for an existing outage, follow these steps:

1. Select an existing outage in Work Agenda.
2. Select Confirm/Restore Outage|AMI Confirm from the Work Agenda Actions menu.
3. If the outage has fewer affected customers than configured limit then new AMI request is created for the meter affected by the selected event; otherwise, a message is displayed stating that the selected event has too many affected meters for a single AMI Request. AMI Customers table of the Event Details tool is opened allowing user to selected specific meters to include into request. In this case the request is created by selected AMI Confirm from Event Details **Actions** menu.

   > **Note:** If you attempt to create an AMI request for a customer that is part of an active AMI request, the AMI Rejected Meters dialog box is displayed. This dialog box lists the customer information associated with the meter that was rejected. Click OK to continue.

Creating AMI Requests for Specific Customers

To create an AMI request for an specific customers affected by an existing outage, follow these steps:

1. Select an existing outage in Work Agenda.
2. Open Event Details tool for the selected event either by double-clicking on the row or by selecting Event Details... from the Work Agenda Actions menu.
3. Once Event Details tool is opened for the selected event navigate to the AMI Customers tab.
4. In the AMI Customers table selected the customers that should be included in the AMI request.
5. Select AMI Confirm, AMI Voltage, or AMI Load Side from the Event Details **Actions** menu depending on the desired AMI request type.

For more information on different types of AMI requests as well as viewing history of AMI data for selected meter see description of AMI-related menu options in **Understanding Event Details** on page 3-1.

Completing AMI Requests

For information on completing AMI requests see **Completing AMI Requests** on page 3-59.

Canceling AMI Requests

For information on canceling AMI requests see **Canceling AMI Requests** on page 3-59.

Re-submitting AMI Requests

For information on re-submitting AMI requests see **Re-submitting AMI Requests** on page 3-59.

Understanding the DMS Status Summary

The Flex Operations DMS Status Summary page provides a read-only view of the Feeder Management tab in Configuration Assistant. Please see **Using the Feeder Management Tab** on page 24-32 for details on the data available in the table.

You may refresh the data in the table by selecting Refresh from the **Actions** menu.

Understanding Switching in Flex Operations

Switching sheets may be created, edited, and instructed using Flex Operations. The Switching Sheet List is used to create and open planned and emergency switching sheets. Select **Switching Sheet List** from the **Selection Tool** to open the Switching Sheet List.

Switching Sheets display a subset of the tabs shown in the NMS Web Workspace client. The tabs included in Flex Operations are Request, Steps, External Documents, Safety Documents, and Tracking/Audit Log. See **Web Switching Sheets** on page 11-4 for details on the included tabs.

Understanding the Switching Sheet List

Once opened, the **Switching Sheet List** displays the Switching Sheets that are in the system.

From the Switching Sheet List, you may open an existing sheet or create a new emergency or planned sheet.

- To open an existing switching sheet, you may either right-click and select **Edit...** from the context menu or double-click the sheet's row.
- To create a new switching sheet, from the **File** menu, select **New**, and then select either the **Planned** or **Emergency** switching sheet option.

Understanding Switching Sheets

Switching Sheets in Flex Operations are very similar to Switching in Web Workspace. The major differences are in how certain actions are performed. See **Web Switching Sheets** on page 11-4 for more information on switching sheets and their components.

The switching sheets have a tabbed layout:

- **Request:** The **Request** tab contains information about the event (whether an outage or a planned switching operation). See **Completing the Request Tab** on page 11-20 for details on the fields available on the **Request** tab.
- **Steps:** The **Steps** tab allows you to add the operations for the switching job.
  - Toolbar

The toolbar screen capture displays the actions available. The toolbar provides the following options (toggle states shown):

a. Save

b. Lock / Unlock

c. Record / Stop Recording

d. Focus the Map

e. Ready for Instruct

f. Instruct

g. Abort Step

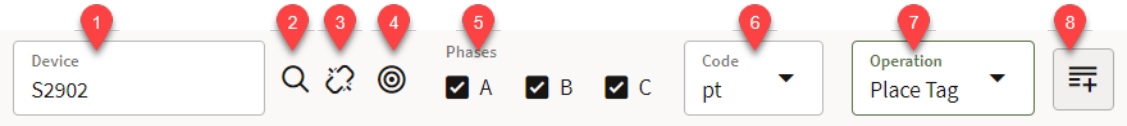
h. Fail Step

i. Uninstruct Step

j. Show/Hide Event and Crew lists (panels). When enabled (shown), the button will be outlined.

k. Show/Hide Manual Step Addition (panel). When enabled (shown), the button will be outlined.

- **Event and Crew List:** Panel contains tables that allow you to see the events and crews associated with the sheet. Click the toolbar button to toggle between showing and hiding the panel.
- **Manual Step Addition:** Panel allows you to add step details manually; this is very useful in Planned Switching where you will need to add each step manually. Click the toolbar button to toggle between showing and hiding the panel.



- **Safety Documents:** The **Safety Documents** tab allows you to create, delete, and edit safety documents that are associated to the switching sheet. Select **New Safety Document** followed by the safety document type from the **Actions** menu to create a new safety document for the switching sheet.

  While the safety document is in the **New** state, the document can be marked as **Deleted**. Select the **Delete Safety Document** option from the **Actions** menu to initiate this feature.

  Select the **Edit Safety Document...** option from the **Actions** menu to open the safety document. The safety document can be edited, state transitioned, and/or verified.

- **External Documents:** The External Documents tab allows you to attach files to the switching sheet. Select **Add Attachment** from the **Actions** menu to open the Attachment dialog box. You can either drag the file you want to add to the dialog box or click the + sign to open Windows Explorer and browse for the file. You can add a description, if desired.

- **Tracking / Audit Log:** The **Tracking / Audit Log** includes the state transition options available to the sheet type that is loaded. It also shows the changes to the switching sheet over time. A comment field and an **Add** button are also included for manually adding audit log entries.

Understanding Planned Switching Sheets in Flex Operations

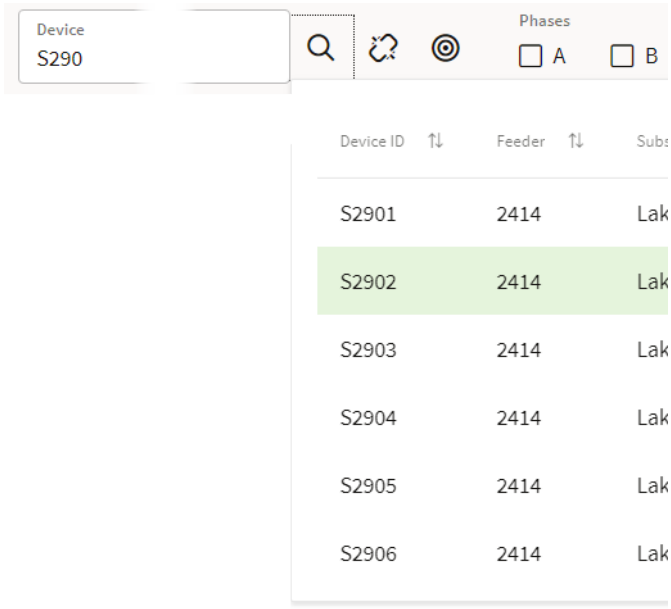
Unlike the NMS Web Workspace client, the Flex Operations client does not have a study mode that would allow you to record steps in a study session. Consequently, you will need to manually add steps to the switching sheet.

To add steps, do the following:

1. Display the **Manual Step Addition** panel.

2. Add steps by:
   a. Selecting a device by doing one of the following:
      - Enter the device ID in the **Device** field.

      - Enter part of the device ID in the **Device** field, click the **Search** button (), and select the device from the returned list of possible matches. For example, search for S290 and select S2902 from the pop-up list.



      - Select the device in the Map and click the **Link** button ().
3. Choose the **Phase**(s) to operate.
4. Choose the **Code** or the **Operation** to perform.
5. Click the **Add Step** button () to add the operation to the sheet.
6. Repeat for each step.

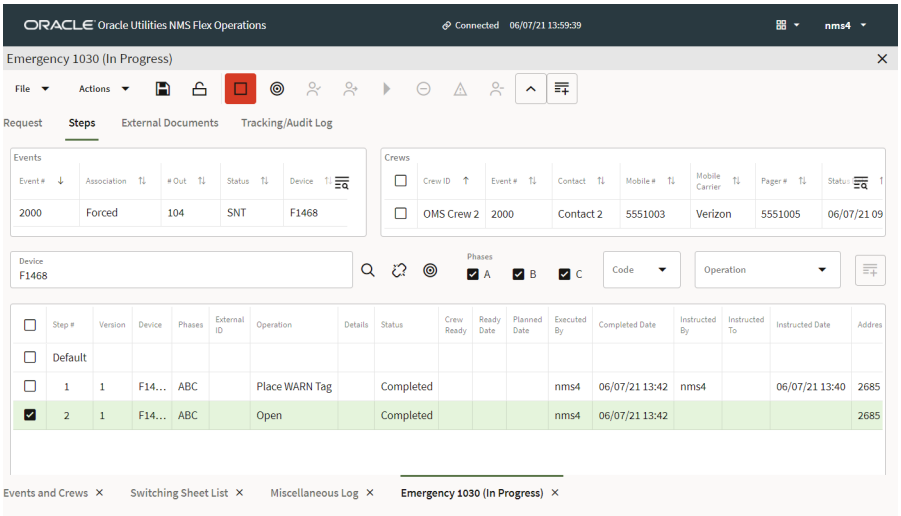
You can also add a step by the **Default** step, right-click, and select **Insert Blank Step** from the **Organize** context menu.

To edit steps, do the following:

1. Select the step, right-click, and select **Edit Step...**.
2. In the Edit Step dialog box, enter the data for the operation. When done, click **OK** or click **Cancel** to close the dialog box without saving).

Understanding Emergency Switching Sheets in Flex Operations

You can record operations as they are instructed or completed. A new Emergency Switching Sheet opens in recording mode so any actions taken in the Map will be recorded as steps.



Note: When you toggle recording off, any switching actions taken in the Map will be recorded in the Miscellaneous Log.

You can complete, instruct, abort, and cancel steps. Note that when you add an **Instruct** step, you will need to complete the step before adding the next step.

See **Emergency Switching** on page 11-90 for information on creating and executing Emergency Switching sheets.

Understanding Step State Transitions in Flex Operations

Switching sheet steps can be transitioned to the states Instructed, Uninstructed, Completed, Aborted or Failed. These actions can be initiated from the right-click context menu or from the sheet's toolbar. The sheet's toolbar will only show the step related actions when the Steps tab is selected.

When working with aggregate steps, Flex Operations is slightly different than aggregate steps in Web Workspace. In Flex Operations, the parent step is instructed and each child step has to be selected and completed. In Web Workspace, all step state transitions for aggregate steps are initiated from the parent step. Uninstructing, aborting, and failing of aggregate steps are all initiated from the parent step.

Safety state transition steps, when completed, will display a dialog version of the associated safety document. This dialog will not have a toolbar, but will have Execute and Cancel button options. These buttons are used to complete the requested state transition or to cancel it. This is the same for safety state transition steps that are completed from Web Workspace.

Understanding the Switching Sheet 's Events List

The Events list on the Flex Operations switching sheets are a list of events linked to the switching sheet. These same events will show up on the switching sheet in Web Workspace. In Flex Operations, the user is restricted to showing Event Details for the switching event and showing the event on the Map.

Understanding the Switching Sheet 's Crews List

The Crews list on the Flex Operations switching sheets are the list of crews assigned to the switching sheet or to the events listed in the Events list. You can manually assign crews to the switching sheet by right clicking the Crews table and selecting the **Select Crew...** option. This will display the Select Crew dialog where you can select one or more crews to assign to the switching sheet.

Crews that have manually been assigned to the switching sheet can be removed from the list by selecting them and choosing the **Remove Crew** option from the right-click context menu.

The selected steps' **Instructed To** field can be updated with crews after the steps have been completed by using the **Update Instructed To in Step**s option from the right-click menu. To assign incomplete steps to crews, select the step followed by one or more crews from the Crews List. This will automatically populate the Instructed To field for the selected steps.

Understanding the Manual Steps Addition Form

The Manual Steps Addition form works the same as it does from the Web Workspace switching sheets. See **Adding Steps Manually** on page 11-43 for more details.

Understanding Safety Documents in Flex Operations

Safety documents may be created, edited, and instructed using Flex Operations. The Safety Documents tool is used to create and open safety documents. Select **Safety Documents** from the **Tool Selector** to open the Safety Documents tool.

Understanding the Safety Documents List

Once opened, the **Safety Documents** tool displays the safety documents that are in the system; it is equivalent to the Web Workspace Safety Document List.

From the **Safety Documents** tool, you may open an existing safety document or create a safety document.

- To open an existing safety document, you may either right-click and select **Edit...** from the context menu or double-click the safety document's row.
- To create a new safety document, from the **File** menu, select **New**, and then select one of the safety document types.

Understanding Safety Documents

Safety documents in Flex Operations are very similar to safety documents in Web Workspace. The major differences are in how device lists are managed. See **Working with Safety Documents** on page 11-102 for more information on the common safety document components.

Understanding the Safety Document Toolbar

The toolbar screen capture displays the actions available. The toolbar provides the following options (toggle states shown):

a. Save

b. Lock / Unlock (Only found on Stand-alone safety documents)

c. Stop Device Selection Recording

d. Issue

e. Unissue

f. Release

g. Complete

h. Abort

Understanding the Tag Points Pane

Displays the devices that the safety document is associated with. This device list is used in the exact same way that it is on the Web Workspace safety documents. The mechanism for turning device recording on is slightly different in that the option is found under each device list's context menu. The turning off of the recording is done from the safety document's toolbar. The icon on the main toolbar will be highlighted in red to indicate that recording is enabled. The label for the device list will also be appended with the text **(Recording)**.

Context Menu Options

- **View on Map...** focuses the Map Viewer on the selected device.
- **Start Device Recording** triggers the safety document to listen for device selections in the Map Viewer so that they can be added to the list. This will change the label for the list to **Tag Points (Recording)**. To turn off recording, select the **Stop Device Selection Recording** option on the safety document's toolbar.
- **Remove Device** is used to remove devices from the list.

Understanding the Grounds Pane

Displays the grounds that the safety document is associated with.

Context Menu Options

- **View on Map...** focuses the Map Viewer on the selected device.
- **Start Device Recording** triggers the safety document to listen for device selections in the Map Viewer so that they can be added to the list. This will change the label for the list to **Grounds (Recording)**. To turn off recording, select the **Stop Device Selection Recording** option on the safety document's toolbar.
- **Remove Device** is used to remove devices from the list.

Understanding Other Safety Document Fields

The remaining fields of the Flex Operations safety documents are the same as they are on the Web Workspace version of safety documents. See **Working with Safety Documents** on page 11-102 for more information.

Using the Miscellaneous Log

The Miscellaneous Log records actions taken outside of a switching sheet. When you perform an action through the Operate Device dialog box (from the Map's Selection Panel), the **Record Into Sheet** field will show whether you are recording to the Miscellaneous Log or to a switching sheet.

See **Using the Miscellaneous Log** on page 11-126 for information on the Miscellaneous Log.

Appendix A

Accessibility Features

This appendix describes the accessibility features available in the Oracle Utilities Network Management System modules.

Understanding NMS Keyboard Navigation Methods

The keyboard can be used instead of the mouse for most options. You can change focus by using the Tab key to focus on the next field or Shift+Tab to focus on the previous field. In tables, arrows can also be used to move between cells. There are some tools, such as tables or text areas, that use Tab and Shift+Tab for their own purposes. In those cases, Control+Tab and Control+Shift+Tab can be used to move to the next component.

To access a menu, press Alt and the underlined letter in the menu name (usually the first character). If there are multiple tools with the same menu keyboard shortcuts in the active window, you can repeat the keyboard shortcut to move to the next tool's menu; for example, when Web Workspace opens, the Web Workspace **File** menu will be opened when you press Alt+F, and the Work Agenda **File** menu will be opened if you press Alt+F again.

To activate an active component's tooltip, press Control+F1. For example, if you have tabbed into the Work Agenda table data, the table cell's tooltip will be displayed when you press Control+F1. The focused field will have an orange outline indicating what field is focused.

> **Note:** Some tools do not focus on a field in a dialog box until you press the Tab key.

Link Selection

Link inside of NMS can be selected by using the space or enter keys with the linked text in focus.

Using NMS with a Screen Reader

NMS may be used with a screen reader by first enabling Java Access Bridge. (See the documentation at https://docs.oracle.com/javase/8/docs/technotes/guides/access/enable_and_test.html for more information.) Next, select **Toggle Accessible Mode** from the **Preferences** menu. This will make various change to NMS to make it more accessible to screen readers. It turns off locked table columns, and allows the Tab and Shift+Tab keyboard shortcuts to focus on labels that wouldn't otherwise be read by the screen readers. Once Accessible mode is toggled on, it can be saved as part of user preferences.

> **Note:** While in general, NMS will work with any screen reader that supports the Java Access Bridge, it was tested specifically with JAWS version 2019.1906.10.

High Contrast

If you require a high contrast display, select the High Contrast or Light color theme. See the **Understanding the User Interface Settings Menu** on page 2-8 for information.

Screen Scaling

NMS can be scaled to make things bigger or smaller by pressing Ctrl and the plus or minus sign, respectively. NMS is generally expected to be usable at up to 200 percent magnification; however, depending on the configuration, there may be windows that will be too tall to be fully visible (especially on displays with limited resolution). Having a high definition monitor can help.

If it is desired that all environments be scaled, a system environment variable NMS_SCALE can be defined. For example, if NMS_SCALE is defined as "2", the application will be displayed by default at twice the size of the standard view.

Appendix B

Acronyms

This appendix lists acronyms found in the Oracle Utilities Network Management System and its documentation.

Acronym	Description
AMI	Advanced Metering Infrastructure
ACT	Active
ADMS	Advanced Distribution Management System
AMR	Automated Meter Reading
API	Application Programming Interface
App	Application (typically mobile or tablet based)
ATO	Automatic Throw Over
AVL	Automatic Vehicle Location
CCB	Oracle Utilities Customer Care and Billing
CIS	Customer Information System
CMI	Customer Minutes Interrupted
CSS	Oracle Utilities Customer Self Service
CSV	Comma Separated Values
CVR	Conservation Voltage Reduction
DA	Distribution Automation / Damage Assessment
DCZ	Delegated Control Zone
DER	Distributed Energy Resource
DERMS	Distributed Energy Resource Management System
DG	Distributed Generation
DMS	Distribution Management System
DNP	Distributed Network Protocol

Acronym	Description
DR	Demand Response
EAT	Estimated Assessment Time
EDM	Energy Delivery Assessment
EMR	Emergency
ERT	Estimated Restoration Time
FCA	Feeder Contingency Analysis
FLA	Fault Location Analysis
FLISR	Fault Location, Isolation, and Service Restoration
FLM	Feeder Load Management
GIS	Geographic Information System
GPS	Global Positioning System
GRP	Group
HSB	Hue/Saturation/Brightness
HTML	Hypertext Markup Language
ICCP	Inter-Control Center Communications Protocol
IEEE	Institute of Electrical and Electronics Engineers
iOS	Operating System for Apple Mobile Devices.
IVR	Interactive Voice Response
JDBC	Java Database Connectivity API
JNDI	Java Naming and Directory Interface
kV	kilovolt
kVA	kilovolt-ampere
kVAr	kilovolt-ampere reactive
kW	kilowatt
LTC	Load Tap Changer
MDM	Oracle Utilities Meter Data Management System
MDT	Mobile Data Terminal
MED	Medical
MWM	Oracle Utilities Mobile Workforce Management
NCG	Network Control Group
NMS	Oracle Utilities Network Management System
NTS	NMS Training Simulator
ODM	Oracle Utilities Operational Device Management

Acronym	Description
OMS	Outage Management System
OPT	Optimization
ORS	Oracle Real-Time Scheduler
OS	Operating System
OSX	Apple Operating System for Macintosh Computers
OUA	Oracle Utilities Analytics
PDF	Portable Document Format
PF	Power Flow
RDBMS	Relational Database Management System
RGB	Red/Green/Blue
ROW	Right of Way
RTF	Rich Text Format
RTU	Remote Terminal Unit
SA	Service Alert
SCADA	Supervisory Control and Data Acquisition
SDK	Software Development Kit
SGG	Oracle Utilities Smart Grid Gateway
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SQL	Structured Query Language
SRS	Service Reliability System
SS	Suggested Switching
STD	Standard
TBG	To Be Grouped
TBU	To Be Ungrouped
TTL	Time-to-Live
URI	Uniform Resource Identifier
URL	Uniform Resource Locator (Internet Address)
VA	Number of Violations After
VB	Number of Violations Before
VVO	Volt/VAr Optimization
WAM	Oracle Utilities Work and Asset Management
WCB	Web Callbacks

Acronym	Description
WCE	Web Call Entry
WLS	Oracle WebLogic Server
WMS	Work Management System
WS	Web Service
WW	Web Workspace
XML	Extensible Markup Language
XSL	Extensible Stylesheet Language
XSLT	Extensible Stylesheet Language Transformations

Appendix C

Event Status and Event Type Codes

This appendix lists and describes coded information that appears in Oracle Utilities Network Management System screens, including:

- Event Status Codes
- Event Type Codes

Event Status Codes

Work Agenda displays the current status of each event listed. The event status is also displayed on the Call Information window. The following table provides the event status codes, their descriptions, and the associated icons used in the Work Agenda and associated tools.:

Status Code	Description	Icon
ASN	Crew is assigned to the event. The assignment has not been dispatched to the crew or mobile system.	
CMP	Event has been completed (event and event details are complete).	
CNL	Event has been canceled by a user (using the Cancel Event button in the Work Agenda window).	
CRT	Acknowledged critical meet.	--
ENR	Crew is en route to the event.	
F-ASN	Crew is assigned to the fault current event. The assignment has not been dispatched to the crew or mobile system.	--
F-CMP	Fault current event has been completed (event and event details are complete).	--
F-CNL	Fault current event has been canceled.	--
F-ENR	Crew is en route to the fault current event.	--
F-NEW	New fault current event.	--

Status Code	Description	Icon
F-ONS	Crew is onsite at the fault current event.	--
F-UAS	Unassigned fault event.	--
INC	Event has been completed, but information needs to be entered in the Event Details window.	
M-CMP	Momentary event has been completed (event and event details are complete).	
M-INC	Momentary event has been restored, but information needs to be entered in the Event Details window.	
M-NEW	New unacknowledged momentary event	--
M-RCVD	Momentary event was received by mobile system and receipt was acknowledged by the MQ adapter.	--
M-SNT	Crew is assigned to the momentary event, and the assignment has been sent (dispatched) to the crew or mobile system.	
M-UAS	Unassigned (acknowledged) momentary event.	
MADE-SAFE	The event has been made safe.	
MNP	Maintenance pending.	
NEW	New unacknowledged event.	--
NFY	Notify alarm.	
O-NEW	New unacknowledged Optimization event.	
O-CMP	Optimization event has been completed.	
O-CNL	Optimization event has been canceled.	
O-INC	Optimization event has been completed, but information must be added to the event.	
ONS	Crew is onsite at the event.	
P-CMP	Planned event has been completed (event and event details are complete).	
P-INC	Planned event has been completed, but information needs to be entered in the Event Details window.	
P-NEW	New unacknowledged planned event.	--
P-RCVD	Planned event was received by mobile system and receipt was acknowledged by the MQ adapter.	--

Status Code	Description	Icon
P-SNT	Crew is assigned to the planned event, and the assignment has been sent (dispatched) to the crew or mobile system.	
P-UAS	Unassigned (acknowledged) planned event.	
RCVD	Order was received by mobile system and receipt was acknowledged by the MQ adapter.	
RED	New critical meet.	--
RSCH	Rescheduled meet.	--
RST	Event has been restored and a crew is still associated with the event.	
S-ASN	Crew is assigned to the SCADA event. The assignment has not yet been dispatched to the crew or mobile system.	
S-CMP	SCADA event has been completed (event and event details are complete).	
S-CNL	SCADA event has been canceled from the Work Agenda.	
S-ENR	Crew is en route to the SCADA event.	
S-INC	SCADA event has been completed, but information needs to be entered in the Event Details window.	
S-MNP	Maintenance pending (SCADA event).	
S-NEW	New unacknowledged SCADA event.	--
S-ONS	Crew is onsite at the SCADA event.	
S-RCVD	SCADA event was received by mobile system and receipt was acknowledged by the MQ adapter.	--
S-RST	SCADA event has been restored and a crew is still associated with the event.	
S-SNT	Crew is assigned to the SCADA event, and the assignment has been sent (dispatched) to the crew or mobile system.	
S-SUS	Crew has been re-dispatched to another event, but is still assigned to this SCADA event.	
S-UAS	Unassigned (acknowledged) SCADA event.	

Status Code	Description	Icon
SNT	Crew is assigned to the event, and the assignment has been sent (dispatched) to the crew or mobile system.	
SUS	Crew has been re-dispatched to another event, but is still assigned to this one.	
T-NEW	A new Protection Scheme event.	--
T-CNL	The protection scheme event has been canceled.	--
T-INC	The protection scheme event has been completed but information needs to be entered into the Event Details window.	--
T-CMP	The protection scheme event has been completed.	--
UAS	Unassigned (acknowledged) event.	
VFY	A probable service outage is in this state if the system reports that the meter at the outage location has power. This state provides an indication for the operator to verify that the customer indeed is out of power.	--
W-ASN	Crew is assigned to the switching event. The assignment has not yet been dispatched to the crew or mobile system.	
W-CMP	Switching event has been completed (the corresponding switching plan has been completed).	
W-CNL	Switching event has been canceled (the corresponding switching plan has been rescheduled).	
W-ENR	Crew is en route to the switching event.	
W-ONS	Crew is onsite at the switching event.	
W-RCVD	Switching event was received by mobile system and receipt was acknowledged by the MQ adapter.	--
W-SNT	Unassigned (acknowledged) switching event manually sent to the mobile system.	
W-SUS	Crew is assigned to the switching event, and the assignment has been sent (dispatched) to the crew or mobile system.	
W-UAS	Unassigned (acknowledged) switching event.	

Event Type Codes

Event Type codes are displayed on the Trouble Call Entry Lists. Below is a complete list of event type codes and their descriptions:

Event Type Code	Description
CSCO	confirmed secondary outage
CSVO	confirmed service outage
FAULT	fault event
FUZZY	fuzzy event
MEET	meet
NFY	notify alarm
NON	non-outage
OPT	optimization event
PDO	probable device outage
PLAN	planned outage
PMO	probable momentary outage
PSO	probable service outage
RDO	real device outage
RMO	real momentary outage
SWP	switching event

Appendix D

Color Coding

This appendix lists and describes color coding that appears in Oracle Utilities Network Management System screens, including:

- Crew Status
- Event Status
- Callback Status
- FLISR Status
- Conductor Symbology
- Feeder/Device Condition Names and Colors
- SCADA Data Quality Codes and Colors

Note: All color coding is configurable and your site may use different colors than those shown in this appendix.

Crew Status

The table below describes the color coding used on the Crew Actions and Crew List windows to indicate crew status when cell coloring is enabled in the Web Workspace **User** menu's **Table Settings** submenu (see **Understanding the Table Settings Menu** on page 2-9 for information). These colors are also used for AVL crew symbols in the Viewer.

Color	Crew Status
Green	En Route
Dark Green	Onsite
Yellow	Unavailable
Cyan	Assigned
Orange	Suspended
Brown	Crew has no control zone (that is, the crew's assigned control zone has been removed from the control zone hierarchy).
White	Available

Event Status

The table below identifies the color coding used on the Work Agenda list to indicate the event status when cell or row coloring is enabled in the Web Workspace **User** menu's **Table Settings** submenu (see **Understanding the Table Settings Menu** on page 2-9 for information).

Row Color	Event Status
White text on dark red background	NEW
White text on light red background	M-NEW
White text on red-orange background	P-NEW
White text on red background	S-NEW
	RED
	NFY
	SNT
	UAS
White text on bright red background	M-SNT
Red text on white background	M-UAS
Black text on yellow background	P-SNT
	P-UAS
	W-SNT
	W-UAS
Black text on dark gold background	S-SNT
	S-UAS
Black text on cyan background	ASN
	S-ASN
	W-ASN
Black text on green background	ENR
	S-ENR
	W-ENR
Black text on dark green background	ONS
	S-ONS
	W-ONS
White text on blue background	RST
	S-RST

Row Color	Event Status
Black text on gray background	CMP
	P-CMP
	W-CMP
	S-CMP
	M-CMP
Black text on orange background	SUS
	S-SUS
	W-SUS
White text on purple background	INC
White text on orchid background	P-INC
Black text on plum background	S-INC
White text on violet background	M-INC
Black text on white background	MNP
	S-MNP
Black text on light green background	C-CNL
White text on brown background	CNL
	S-CNL
	W-CNL

Feeder Automation Status

The table below identifies the color coding used in the Work Agenda **Feeder** column to indicate the feeder's FLISR automation status. This is enabled when a cell or row coloring option is selected from the Web Workspace **User** menu's **Table Settings** sub-menu (see **Understanding the Table Settings Menu** on page 2-9 for more information)..

Row Color	FLISR Status
Orange text on white background	Automatic
Default	Manual
Default	Disabled
Default	Restore Only

FLISR Status

The Work Agenda is the starting point for viewing the status and results of the FLISR calculations. Each outage row is color-coded to represent the FLISR status of a job. The background color of the "Event #" field in the Work Agenda list indicates the FLISR status:

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Row Color	Description
Yellow	The job is currently being processed as a FLISR job and a solution is being searched for.
Green	A FLISR solution has been found for the job.
Light Red	A FLISR solution has been found but it overloads the restoring feeder – manual intervention will be required.
None	No FLISR solution can be found for this job.

Callback Status

The Callback Status field on the Perform Callbacks List Window and the Perform Next Callback window is color-coded to indicate whether a callback attempt has been made and the result of the last attempt. The following table shows the default color coding used for callback status:

Color	Description
White	**Not Called** - indicates you have not yet called the customer (default). The callback remains in the callbacks list.
Blue	**Restored** - indicates the customer confirmed their service was restored. The callback is considered complete and is removed from the callbacks list the next time it is brought up.
Red	**Not Restored** - indicates you called the customer, and the customer indicated that service was not restored. The callback is considered complete and is removed from the callbacks list the next time it is brought up. The call is re-introduced into the Oracle Utilities Network Management System for re-analysis and restoration and a new callback will be generated when that event is restored.
Green	Indicates one of the following: **No Answer** - indicates you attempted to reach the customer, but nobody answered the telephone. The callback remains in the callbacks list. **Busy** - indicates you attempted to reach the customer, but the line was busy. The callback remains in the callbacks list.
Brown	**Cancel** - cancels the callback. The callback is considered complete and is removed from the callbacks list the next time it is brought up.

Conductor Symbology

In the Viewer, conductor symbology changes color and line style (for example, pattern, thickness) for different types of conductors and topology states. Conductor symbology is configurable. The following table shows the default color coding used for conductor symbology:

Line Style	Color	Description
Thin	Red	A Phase
Thin	Yellow	B Phase
Thin	Blue	C Phase
Dashed	Black and white	De-energization
Dashed	Black and gray	Partial energization
Thick	Light blue overlay	In Trace mode, indicates a conductor that is part of the path from a selected device

Line Style	Color	Description
Thick	Dark pink	Grounded
Thick	Dark red	Different color codes for individual phases
Thick	Magenta overlay	Loop, bi-directional flow
Thick	Purple overlay	Parallel
Solid	Varies	Overhead line.
Dashed	Varies	Underground cable.

Feeder/Device Condition Names and Colors

The Feeder Load Summary and Feeder Load Management windows use color coding to indicate violations or warnings associated with feeders and devices. The following table lists the feeder/device condition number, name, and corresponding cell background and text coloring.

Condition Number	Condition Name	Condition Color
0	Normal	Black text on green background
1	Backfeed Warning	Black text on yellow background
2	Not currently used.	
3	Under Voltage Warning	Black text on yellow background
4	Over Voltage Warning	Black text on yellow background
5	Switch Overload Warning	Black text on yellow background
6	DistTrans Overload Warning	Black text on yellow background
7	Feeder Capacity Warning	Black text on yellow background
8	Conductor Overload Warning	Black text on yellow background
9	PowerTrans Overload Warning	Black text on yellow background
10	DistGen Overload Warning	Black text on yellow background
11	DistGen Time-to-live Warning	Black text on yellow background
12	Unprotected Ground Warning	Black text on yellow background
13	Ground Reach Warning	Black text on yellow background
14	Unprotected Phase Warning	Black text on yellow background
15	Phase Reach Warning	Black text on yellow background
50	Not a valid violation type; used for non-violations that need operator attention.	
100	Not a valid violation type; used to distinguish between warnings and violations.	
101	Backfeed	Black text on light gray background
102	Not currently used.	
103	Under Voltage	Black text on light brown background
104	Over Voltage	Black text on gold background
105	Switch Overload	Black text on cyan background
106	DistTrans Overload	Black text on magenta background
107	Feeder Capacity	Black text on pink background
108	Conductor Overload	White text on orange background
109	PowerTrans Overload	White text on red background

Condition Number	Condition Name	Condition Color
110	DistGen Overload Violation	White text on red background
111	DistGen Time-to-live Violation	White text on red background
112	Unprotected Ground Violation	White text on purple background
113	Ground Reach Violation	White text on purple background
114	Unprotected Phase Violation	White text on purple background
115	Phase Reach Violation	White text on purple background
201	Model Error	Black text on red background
202	Inconclusive	Black text on red background
203	SCADA Inconclusive	Black text on yellow background
204	SCADA Suspect	Black text on red background

SCADA Data Quality Codes and Colors

The following color codes are used for SCADA data quality cells in Feeder Load Management.

Data Status	Data Quality Color Indicators
Valid	Black text on green background
Suspect	Black text on red background
Invalid	Black text on red background
Load	Black text on red background
Profile	Black text on red background

Appendix E

Tool to User Type Matrix

This appendix lists the Oracle Utilities Network Management System tools that are available to each user type in the following environments:

- Web Workspace
- Storm Management

Web Workspace

Tool	Full Operations plus Switching	Full Operations	Trouble Maintenance	Crew Operations	View Only	Administration	Switching Request	Trainer
Alarms Lists	X	X	X		X	X		X
AMI Requests (amr)	X	X				X		X
Attributes	X	X	X	X	X	X		X
Authority	X	X	X	X	X	X		X
Call Entry								X
Condition Summaries	X	X	X		X	X		X
Configuration Assistant						X		X
Control	X	X	X	X	X	X		X
Crew Actions	X	X	X	X	X	X		X
Conservation Voltage Reduction (powerflow)	X					X		X
Damage Assessment	X	X	X			X		X
Damage Reports	X	X	X			X		X

Tool	Full Operations plus Switching	Full Operations	Trouble Maintenance	Crew Operations	View Only	Administration	Switching Request	Trainer
DMS Summary (flm)	X	X			X	X		X
Event Details	X	X	X	X	X	X		X
Event Log	X	X	X	X		X		X
Fault Location Analysis (fla)	X	X	X			X		X
FLISR (flisr)	X					X		X
FLM Summary (flm)	X	X			X	X		X
FLM Tool (flm)	X	X			X	X		X
Manage Documents	X	X				X		X
Safety (switching)	X				X	X		X
SCADA Summary	X	X	X			X		X
Suggested Switching (suggested_switching)	X					X		X
Switching (switching)	X				X	X	X	X
Topology Validation Viewer	X	X				X		X
Trouble Info	X	X	X	X	X	X		X
Trouble Summary	X	X	X		X	X		X
User Log	X	X				X		X
Viewer	X	X	X	X	X	X		X
Optimization (volt_var)	X					X		X
Weather Zone Forecast (flm)	X	X			X	X		X
Work Agenda	X	X	X	X	X	X		X

Storm Management

Tool	Full Operations	View Only	Storm Administration
Calculate Crews		X	
ERT Override	X		
Forecast Profiles	X		
Force Simulation	X		
Storm List			X
Storm Report	X	X	
Study Session Control	X		
Summary Information	X	X	
Toggle Storm Mode	X		
Zone Selection	X	X	