

**Oracle® Service Parts Planning**  
Implementation and User Guide  
Release 12.1  
**Part No. E13338-03**

April 2009

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**Oracle Service Parts Planning Implementation and User Guide, Release 12.1**

**Part No. E13338-03**

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# Preface

## Intended Audience

Welcome to Release 12.1 of the *Oracle Service Parts Planning Implementation and User Guide*.

Users and implementation team

See Related Information Sources on page xii for more Oracle Applications product information.

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## **Structure**

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## **Related Information Sources**

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### Oracle Demand Signal Repository User Guide

Oracle Demand Signal Repository is used by manufacturers to collect detailed retailer point-of-sale and other demand data, and analyze the data to identify issues and opportunities. Typical retail data sources include daily point-of-sale, on-hand inventory, store orders and receipts, distribution center withdrawals, returns, store promotions and sales forecasts.

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Oracle Manufacturing Operations Center  
Implementation Guide

Oracle Manufacturing Operations Center enables planners to monitor and improve plant performance by analyzing plant floor data. It uses manufacturing operations data to generate reports and monitor production performance in real time.

Oracle Advanced Planning Command Center  
User's Guide

Oracle Advanced Planning Command Center unifies all the Advanced Planning applications, such as Demand Management, Real-Time Sales and Operations Planning, Strategic Network Optimization, Advanced Supply Chain Planning, Distribution Requirements Planning, and Inventory Optimization. It provides a unified user interface and a single repository for all data. Its flexibility allows users to access data from external supply chain planning applications and make it available for reporting and analysis within a unified user interface based on Oracle Business Intelligence - Enterprise Edition (OBI-EE).

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## Integration Repository

The Oracle Integration Repository is a compilation of information about the service endpoints exposed by the Oracle E-Business Suite of applications. It provides a complete catalog of Oracle E-Business Suite's business service interfaces. The tool lets users easily discover and deploy the appropriate business service interface for integration with any system, application, or business partner.

The Oracle Integration Repository is shipped as part of the E-Business Suite. As your instance is patched, the repository is automatically updated with content appropriate for the precise revisions of interfaces in your environment.

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Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL\*Plus to modify Oracle Applications data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle Applications tables are interrelated, any change you make using an

Oracle Applications form can update many tables at once. But when you modify Oracle Applications data using anything other than Oracle Applications, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle Applications.

When you use Oracle Applications to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL\*Plus and other database tools do not keep a record of changes.

# Part 1

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## Setting Up Service Parts Planning



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# Introduction

## Business Need

Repair service operations need service parts planning systems to ensure that the right parts are at the right locations, at the right times, and in the right (usable) condition, while being consistent with inventory budgets and service level targets.

Service parts inventory management differs from product inventory management; hence the need for functionality designed to handle special service parts situations such as: reverse flow of potentially repairable parts, combinations of stock-keeping units (SKUs) and locations, mission-critical parts, and intermittent demand.

Complex rules govern the service supply chain planning process. The overall business requirement is to supply needed repair parts from the lowest cost source first:

1. Exhaust existing on-hand inventory, then
2. Evaluate transfer of on-hand inventory from other locations, then
3. Evaluate repair of defective parts, then
4. Procure new parts.

The Service (Repair) Parts Planning module (SPP) of the Oracle Planning and Scheduling (APS) suite enables you to plan service-centric supply chains.

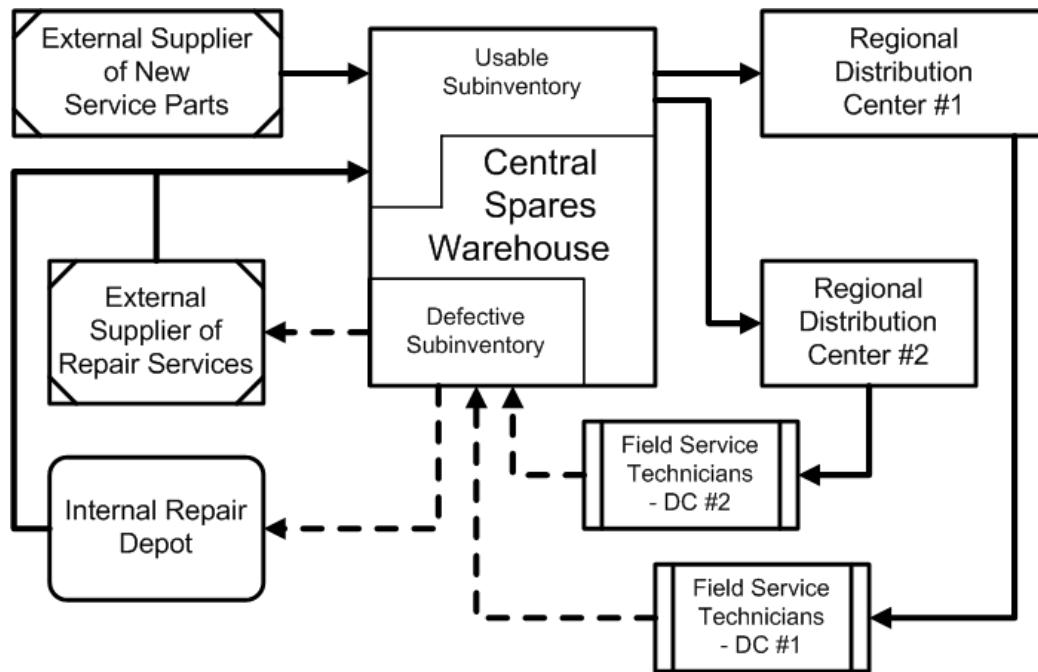
### Service Parts Planning:

- Accommodates planning for service organizations from the central warehouse to trunk stock, and from the service technicians' stock of defective parts back to warehouse locations for defective parts.
- Optimizes repair and new-buy decisions, while considering item supersession and product substitutions.

- Spans both short- and long-term planning horizons.
- Generates customizable, business-specific exceptions and recommendation messages for carrying out the plan.

## Supply Chain Modeling

The following figure illustrates an example supply chain for service planning and execution. The solid arrows represent forward material flow of usable spare parts. Dashed arrows represent material flow of repairable defective parts.



## Supply Chain Organizations Modeled by SPP

Based on the example supply chain, service part plans cover the following organizations:

- External supplier of new parts (new buy)
- External supplier of repair services
- Internal Depot Repair
- Central spares warehouse
  - Central defective warehouse, if any

- Regional warehouses (replenishing organizations)
  - Regional defective warehouses, if any

Oracle Spares Management generates plans governing field service organizations and field technician trunk stock.

See Modeling Field Service Technician Organizations, page 1-4.

The transfer rules between supply chain organizations ensure that service part requirements are replenished.

## Modeling Repair Supplier Organizations

To enable multicomppany planning and execution in the reverse supply chain, if the supply base consists of external repair suppliers, the repair supplier must be associated with an organization. For repair returns planning, repair inventory is usually stored at a defective warehouse and pulled to the supplier site as required.

In the service supply chain, the repair supplier can be managed as a:

- Push – preposition relationship

In Push relationships, all defectives are prepositioned at the repair supplier site, based on (monthly or quarterly) contract agreements.

- Pull – On demand return or repair return relationship

In Pull relationships, the defectives are moved for repair only when a demand occurs at the replenishing organization.

With this set up, the same supplier organization can be used to plan items for both Pull and Push relationships.

For more information about repair programs and supplier relationships, see the *Oracle Spares Management User Guide*.

For more information about the relationship between repair programs and repair lead time, see Repair Program Influence on Service Supply Chain Lead Time Offset, page 6-5.

## Modeling Depot Repair Organizations

Service Parts Planning supports two business flows for depot organization planning:

- Field service flow

The depot organization does not start the repair unless and until a need arises at the warehouse. In the field service flow, depot repair internal organizations perform repair operations. Depot repair organizations are defined as separate organizations in the service supply chain. This means that parts move in and out of the repair organization before and after the repair.

- Customer returns flow

The Depot Repair organization repairs, and then returns the same part to the customer. In the customer returns flow, service planning uses historical data of spare part consumption to forecast spare parts that are required to perform repairs. Because in a depot organization, planning forecasts *independent* material requirements, planning does not use bills of material and routings to plan for component requirements.

When an actual return of a part occurs, service execution (Depot Repair) creates a repair work order to repair the product, and then adds components as required.

For planning purposes, key requirements for Depot Repair include:

- Generating forecasts for spare parts
- Planning based on part condition
- Netting existing repair work orders
- Generating planned orders for repair, and to move inventory in and out if required

## Defining Default Subinventories at the Repair Organizations

All repair organizations, whether internal or external, must include at least one defective and one usable subinventory that is netable. These definitions reside in the Field Service Spares Management module of the E-Business Suite.

When you manually raise internal sales orders (ISOs) to move material, Spares Management and Depot Repair ensure that ISOs to move the defective outbound shipments have an attached defective subinventory. This identifies and defines the movement of defective items in the supply chain.

### Defective and Usable Subinventories

The supply chain model segregates usable parts from defective parts into subinventories that are designated in the E-Business Suite as either usable or defective.

No restrictions are placed by the system on the central warehouse with respect to defective parts. This means that the defectives can:

- Be stocked in a separate organization, or
- Exist in the same organization, but in designated subinventories.

## Modeling Field Service Technician Organizations

Field service technician organizations and customer organizations are not modeled in Service Parts Planning.

Oracle Spares Management generates plans governing field service organizations and

field technician trunk stock. This functionality includes prescribing inventory replenishment policies for the service technician's trunk stock, return of excess and defective inventory, and sharing inventory between technicians.

Spares Management models field technicians as customer and customer site organizations. Usable and defective inventory in the field service technicians' trunk stock are modeled as technician organization subinventories. All internal sales orders for outbound shipments raised from technician organizations carry the technician's name as a customer name and the subinventory location as the customer site. All ISO outbound shipments from the field move material to the designated subinventory and location (trunk stock).

#### **Subinventory Owners**

Service Parts Planning is not affected by subinventory ownership. In Spares Management, the association between a subinventory and a technician (employee) is a many-to-many relationship. In cases in which one subinventory ties to multiple technicians, then the default owner attaches as the technician for that subinventory. If internal sales orders (outbound shipments) and internal requisitions (inbound shipments) from field organizations do not have an attached subinventory, then these orders and requisitions are attached to the default customer and customer site, as in an ordinary transfer.

Service Parts Planning does not plan for field service technician organizations, but does plan for all other entities.

## **Related Topics**

See Supply Chain Organizations Modeled by SPP, page 1-2.

## **Solution Overview**

The primary supply chain management processes and decisions are:

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- **Spares Demand and Supply Forecasting**

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- 1 Forecast *demand* for spares at the regional distribution centers.

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- **Spares Demand and Supply Forecasting**
- 2 Forecast *supply* of defective returns to the central warehouse (sub inventory).

Generate demand and supply forecasts for spare part items in the replenishing organizations based on either historical data or installed population data. Historical data can be either *shipments* to the field or *usage* in the field.

Complementary forecasting functionality available in Oracle Demantra Demand Management supports both forecasting processes. See the *Oracle Demantra Demand Management Users Guide*.
- **Service Parts Planning (for Warehouses)**
- 3 Establish the need for spares supply at central and distribution warehouses.

Set inventory policies for spare part items, either by using Oracle Inventory Optimization (I/O) planning or by manually defining safety stock item attributes.

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-	<b>Spares Demand and Supply Forecasting</b>
4	<p>Determine the source of spares supply, whether new, external repair, or internal repair.</p> <p>Generate action message recommendations to balance supply with demand for each quantity and due date. Satisfy highest demand priority first. Use the following sequence of supply:</p> <ul style="list-style-type: none"> <li>a) Consume on-hand inventory located at the demand organization.</li> <li>b) Commit on-order supplies at the demand organization.</li> <li>c) Consider using supersession parts, if applicable.</li> <li>d) Use sourcing rules tied to the latest item revision to determine the next source of supply: <ul style="list-style-type: none"> <li>• Reallocation transfer - Consider transferring declared excess inventory from other organizations.</li> <li>• Supersession transfer - Search the supersession item supply chain for on-hand inventory and on-order supplies, based on sourcing rules.</li> <li>• Repair defectives - Search the supply chain for inventory of defective items, while considering repair lead time and repair yield. Also, this search is capable of considering that defective inventory of certain lower revision parts can be repaired to fulfill demand for higher revision parts.</li> <li>• Procure new parts that conform to the latest revision. Raise exception messages in cases of supplier capacity overload.</li> <li>• If lead time and capacity constraints are not enabled, and the demand cannot be met on the due date, then attempt to compress the supply lead time. Additionally, verify whether the plan is supposed to use only the primary path, in which case planning will transverse only the highest rank for on-hand, repair, and new buy supplies.</li> </ul> </li> </ul>
5	Execute sourcing recommendations.
-	<b>Spares Management (for Field Service)</b>
6	Establish replenishment policy for individual technicians.
7	Execute replenishment for technicians.

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### - Spares Demand and Supply Forecasting

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- 8 Schedule field service.
- 9 Debrief and return defective spare parts to central warehouse.

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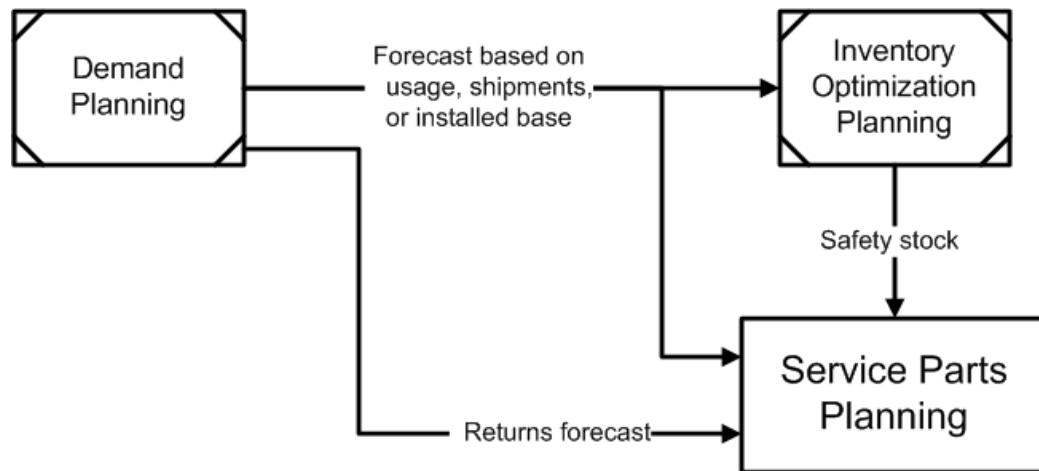
Complementary planning functionality available in Oracle Field Service Spares Management covers primary processes #6 through #9 as they relate to field service organizations and technicians' trunk stock. See the *Oracle Spares Management Users Guide*.

## Service Supply Chain Forecasting Modes

The Service Parts Planning solution supports both traditional and inline forecasting modes:

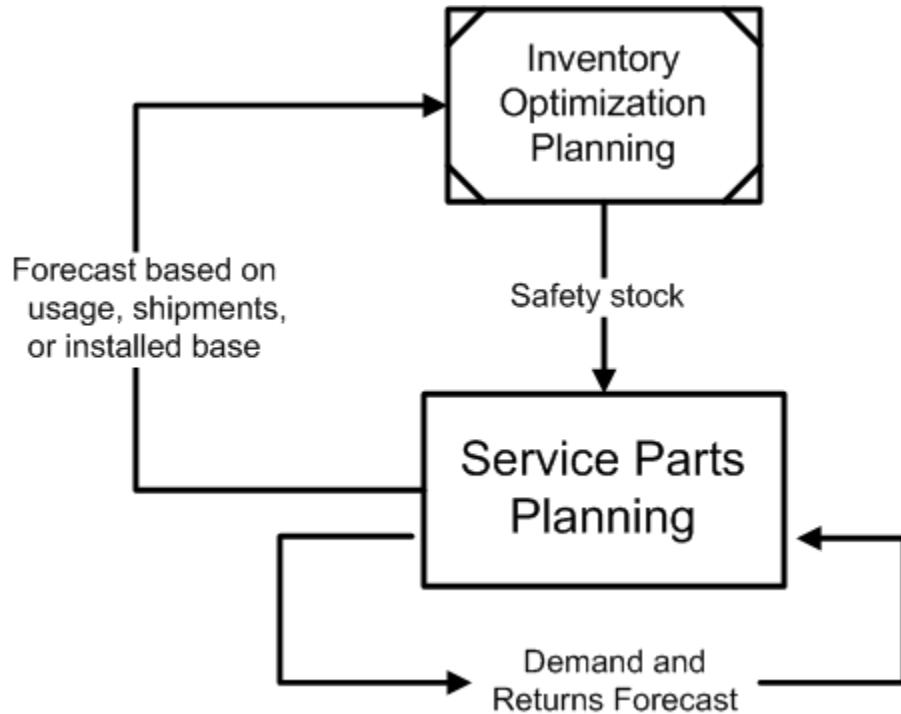
### Traditional.

A demand planning system generates a demand forecast that serves as a demand schedule input to the service parts plan, and where implemented, also to the inventory optimization plan. The demand planning system also generates a returns forecast that serves as a supply schedule input to the service parts plan.



### Inline.

In this scenario, the Service Part Planning system uses Oracle Demantra Demand Management functionality to generate both the service parts demand and defective returns supply forecasts.



- In either mode, forecasts can be based on usage history, shipment history, or returns history.
- In the case of new product introductions or similar situations where there is insufficient history for a reliable basis, the inline mode provides the ability to base forecasts on the item's install base population and average failure rate.

## Solution Integration

The Service Parts Planning solution integrates with the following Oracle products:

- Oracle Demantra Demand Management
- Oracle Order Management
- Oracle Procurement
- Oracle Inventory
- Oracle APS Inventory Optimization – optional

Oracle products that depend on Service Parts Planning are:

- Oracle Field Service Spares Management
- Oracle Depot Repair

## Setup Sequence

This part of the guide describes the sequence of steps to set up Service Parts Planning:

1. Set up source instance, page 2-1 and destination instance, page 2-10 data.
  - Set relevant item and organization attributes.
2. Collecting Source Data, page 3-1 (to SPP)
  - Collect service part usage, returns, install base history, inventory balances, and transactional data such as sales orders and purchase orders.
  - View collected data; the demand data report is enabled.
3. Set Up Inline forecasts, page 4-1 . Otherwise, forecasts are entered as a Demand Schedule from a demand planning system.
  - Create forecasting rules (in SPP).

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    - Create forecasting rules in service supply chain setup.
    - Assign forecast method and define basis for calculating the forecast.

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  - (Optional) Change the forecast parameter default values for the selected forecast method.
  - Assign forecast rules to items.

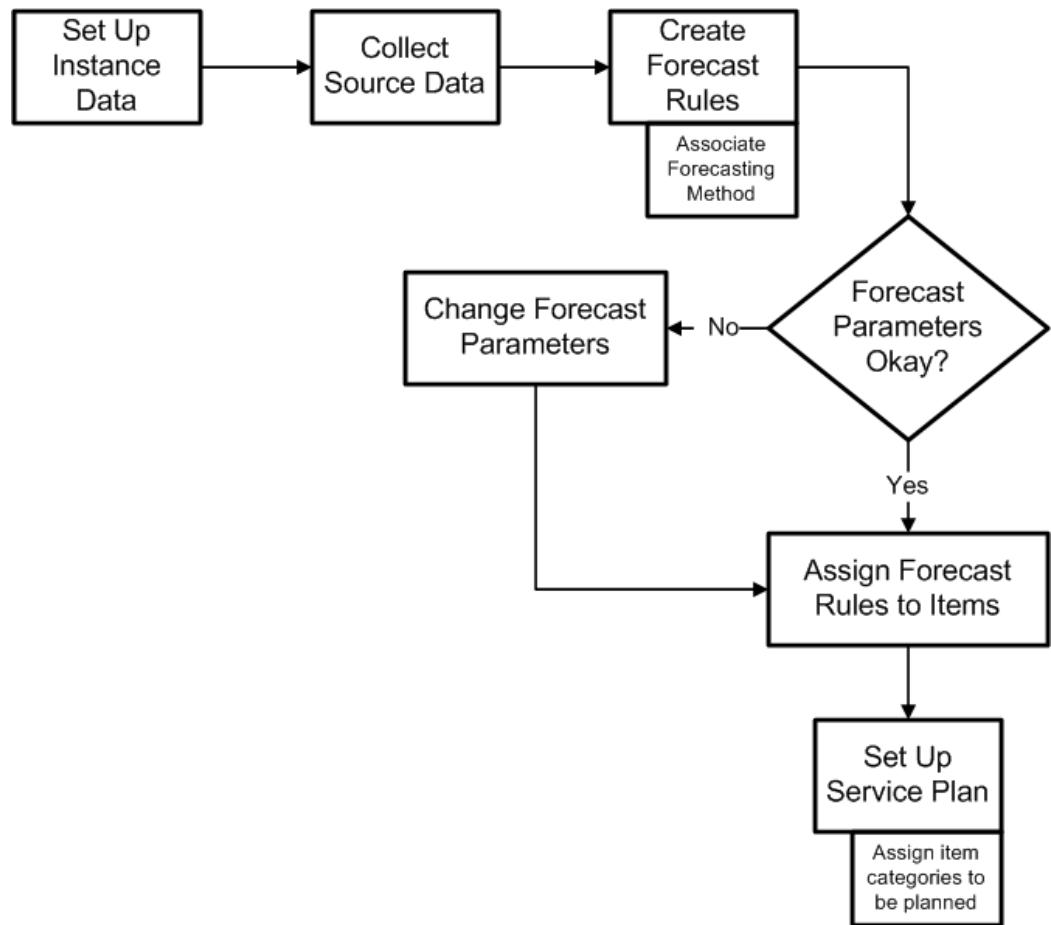
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    - Use items query to choose items.
    - Update or change the forecast rule assigned to these items.

---
4. Set up the service plan.
  - Define the service plan name, page 8-1.
  - Associate categories of items and organizations for the plan.

- Assign forecast scenarios.
- Choose all relevant plan option attributes.
- Create product - part relationships. – This is done on the Failure Rate window on the Destination (SPP) side, not on the source side.
- Set up Sourcing Rules, Assignment Sets, Item Attributes, and so on.

For more information about setup, see the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.





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## Setting Up Source and Destination Instance Data

This chapter covers the following topics:

- Source Instance Setup Data
- Defining Source Instance Item Attributes
- Defining Organization Type
- Associating Field Technicians with Subinventories
- Setting the Part Condition Subinventory Type
- Product – Part Relationships
- Defining Item Relationships
- Destination Instance Setup Data
- Defining Destination Instance Item Attributes
- Parts Usage View
- Setting up the Supply Chain

### Source Instance Setup Data

The following data is set up in the source instance and collected to the Service Parts Planning tables.

### Source Instance Item Attributes

The following item attributes are set up in the repair source organization on Inventory > Items > Organization Item > (T) MPS/MRP Planning.

- **Repair program** – Spares Management supports the following repair programs for a given item and repair supplier combination. This information affects both

planning repair lead time and generated recommendation messages.

- Repair Return (pull)
- Repair Return with prepositioning (push)
- Advanced Exchange without prepositioning
  - Advanced Exchange on PO issue
  - Advanced Exchange on Defective Receipt
- Advanced Exchange with prepositioning
  - Advanced Exchange on PO issue
  - Advanced Exchange on Defective Receipt

For more information about Repair Programs see External Repair Execution Management, page 10-5.

- **Repair Yield**

This attribute, expressed in percent, represents the proportion of the item quantity sent to repair that is successfully repaired to specifications for usable parts. This definition is always in the context of the final usable part or product. For example, if item B is created by repairing item A, then planning uses the repair yield for item B when calculating the proportion of defective item A that is successfully repaired.

- **Repair Lead Time**

This attribute represents the amount of time that the repair organization requires, in days, to process a defective part into a usable part. This definition is always in the context of the final usable part or product. For example, if item B is created by repairing item A, then planning uses the repair lead time for item B when calculating the lead time offset to repair defective item A.

- **Prepositioning Point**

This item attribute check box is used in the Push type of relationship with the repair supplier to indicate that the item's defectives are physically stored in advance of actual need at the repair supplier's site. When planning hits a prepositioning point for an item and organization combination, it pushes all existing supply down stream to this point.

The assumption is that the prepositioning inventory process is triggered based on supplier contracts in the execution system. This could include contract constraints, such as shipment size, frequency, and maximum and minimum storage capacity at the repair supplier site. Planning nets through the repair supplier to use up existing, prepositioned defective inventory prior to recommending additional movement of defectives.

**Note:** In the case of multiple sourcing of repair, Oracle recommends not setting the prepositioning points for multiple item and repair supplier combinations. When multiple source prepositioning relationships are defined, planning moves the entire inventory to the first repair supplier encountered.

Service Parts Planning, however, plans primarily in the Pull mode, which is an on demand type of repair return relationship. SPP does not create plans to preposition inventory.

## Related Topics

Defining Source Instance Item Attributes, page 2-3

## Defining Source Instance Item Attributes

Several item attributes are set up in the source instance, and then collected for use in Service Parts Planning.

### To define item attributes at the repair source organization:

1. From the Manufacturing and Distribution Manager responsibility in the source instance, change organizations to the repair source organization.
2. Navigate to the Organization Items form.

Inventory > Items > Organization Item

The Find Organization Items window appears.

3. Find the item, and then click OK.

The Organization Items form is populated with information about the selected item.

4. Navigate to the MPS/MRP Planning tab.

5. At the lower right

1. Select one of the Repair Programs from the list of values.

See External Repair Execution Management, page 10-5.

- Advanced Exchange on Defective Receipt
- Advanced Exchange on PO issue
- Repair Return

2. Specify the Repair Yield percentage.
3. Define the Repair Lead Time
4. Select the Preposition check box, where applicable.
  
6. Click Save.

### **Source Instance Item Attributes for Service Planning:**

<b>Item Tab</b>	<b>Field</b>	<b>Description</b>	<b>Field Type</b>	<b>Default Value</b>
MPS/MRP Planning	Repair Program	The repair program relationship for an item and supplier combination	List of Values (LOV): Advanced Exchange on Defective Receipt, Advanced Exchange on PO issue, Repair Return	Repair Return
MPS/MRP Planning	Repair Yield	The yield rate of defectives being repaired, in percent	Number (%)	Null
MPS/MRP Planning	Repair Lead Time	Time, in days, required to repair a part	Number	Null
MPS/MRP Planning	Preposition Inventory	Indication of whether planning pushes defective inventory to this point	Check box	Not selected

## **Defining Organization Type**

Because field technicians and internal repair depots are both modeled as inventory organizations, the Organizations form provides an organization type drop down field with values including None, Field Technician, and Depot Repair. This information helps the collection process identify and collect the correct data streams for Service Parts Planning.

For example, the history of outbound shipments to fulfill sales orders and internal sales orders is collected for all organizations. However, for purposes of forecasting shipments

to the field, Service Parts Planning considers only the history of shipments to organizations designated as organization type Field Technician.

Field	Description	Validation	Default Value
Organization Type	Indicates the type of organization for collection, and affects how planning uses the data stream.	LOV contains None, Field Technician, and Depot Repair.	None

#### To define organization type:

1. From the Advanced Planning Administrator Responsibility, navigate to the Application Instances form.  
Admin > Instances  
The Application Instances form appears.
2. Select the destination instance.
3. Click the Organizations button.  
The Organizations window appears.
4. Select the repair organization. In the Type column, select the organization type from the list of values:
  - None
  - Field Technician
  - Depot Repair
  - External Repair
  - Supplier
5. Click Save.

## Associating Field Technicians with Subinventories

In Spares Management, technicians are modeled as external organizations. These organizations contain separate subinventory locations for defective and usable parts. Associating field technicians with subinventories ties internal sales orders (for outbound shipments to field organizations) to organizations of type Field Technician.

Oracle Spares Management functionality available from the Allocation Workbench allocates scarce supply to the technicians' trunk stock, based on internal sales orders and internal requisitions raised by the field technicians.

### To associate field technicians to subinventories:

1. From the Spares Management responsibility, navigate to the Addresses and Subinventories window.  
Setup > Addresses and Subinventories
2. Select the employee resource from the Resource Type list of values.
3. Select the field technician's name from the Employee Name list of values.
4. On the Addresses tab, enter the employee's address information.
5. Select the Subinventories tab.  
The employee's name appears as the subinventory owner.
6. On the Subinventories tab, select the field technician organization from the Organization list of values.
7. Select the appropriate subinventory from the Subinventory list of values.
8. (Optional) Specify the part condition for the items stored in this subinventory.  
See Setting the Part Condition Subinventory Type, page 2-6.
9. (Optional) Specify the effectivity start and end date. The start date default value is today's date.
10. Click Save.

## Setting the Part Condition Subinventory Type

Both defective and usable inventory can exist in the same organization. When the same part exists in two different conditions, you need to differentiate between the usable and the defective stock such that proper netting and sourcing logic can be used to plan the supply chain.

Spares Management uses the subinventory Type to distinguish usable from defective on-hand inventory. Planning collects this data, and appropriately marks the condition of the on-hand stock. Inventory stored in a defective subinventory is marked as Defective. Inventory stored in a usable subinventory is marked as Usable.

### To set the part condition subinventory type:

1. From the Spares Management responsibility, navigate to the Addresses and Subinventories window.  
Setup > Addresses and Subinventories
2. Select the Subinventories tab.
3. On the Subinventories tab, select the repair depot or field technician organization from the Organization list of values.
4. Select the subinventory from the Subinventory list of values
5. Specify the part condition by selecting one of the following Condition list of values.
  - Defective
  - Usable
6. (Optional) Specify the effectivity start and end date. The start date default value is today's date.
7. Click Save.

## Product – Part Relationships

You can create product - part relationships based on a data stream, based on a service item, or both. Item relationships defined here are supplied to the repair bill for a product.

### Supersession.

Spares Management uses the inventory item relationship called *supersession* to capture the supersession chain. The supersession definition defines global supersession and repair capability.

### Repair to.

The Repair to definition determines:

- Whether the defective part is repairable
- Whether the defective part can be repaired to a higher (more recent) version part in the supersession chain.

In the forward supply chain, which consists of only usable parts, the disposition code default value is Use to Depletion. If you want a disposition code of Scrap, the available on-hand inventory of the superseded item must be moved to a non netable subinventory. In case of a New Buy recommendation, planning always orders the latest

revision of the supersession chain. In the reverse supply chain, the Repair to portion of the definition determines the global repair capability for the supersession chain (repair yield and lead times are considered).

**Note:** Any item can be repaired to itself, without the need for an explicit definition.

Service supply chain planning honors the supersession chain and the disposition code.

#### **Supersession Items and Inline Forecasting.**

Forecasts are always generated for the latest (active) supersession item. Service Parts Planning supports supersession effectivity dates when generating the spare part forecasts. When generating forecasts for the latest supersession item, planning considers the history for all superseded items.

For example, today's date is April 1st. The supersession chain is defined as follows:

A ->A1 -> A2 <- -> A3.

Part A4 supersession of A3 is planned to go into effect in the future, on May 15th.

The forecast for the period April 1st through May 14th is generated for part A3, and is generated for part A4 from May 15th onward. The forecasts are based on history data for parts A through A3.

#### **Planning for Related Items.**

When SPP generates a demand plan or a replenishment plan, items that are related as part revisions, supersession items, and components of a Depot Repair work order are planned as a group.

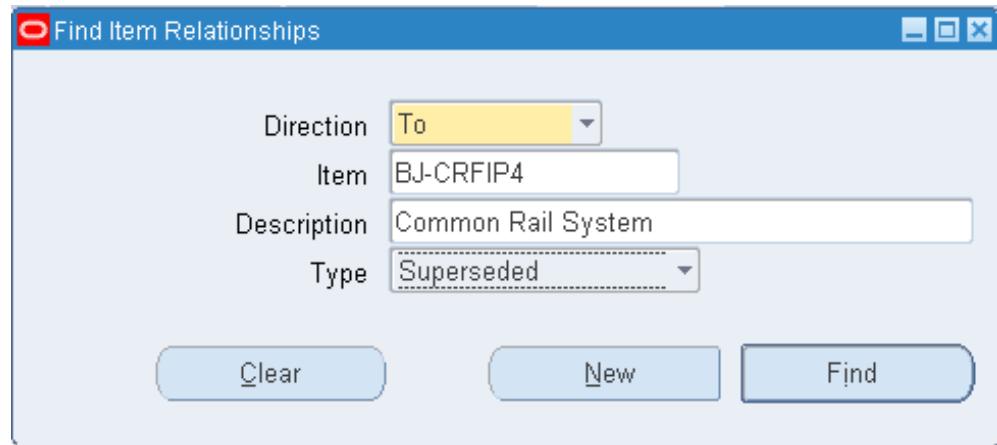
## **Defining Item Relationships**

#### **To define item relationships:**

1. From the Manufacturing and Distribution responsibility, navigate to the Item Relationships window.

Inventory > Items > Item Relationships

After you select an organization, the Find Item Relationships window appears.

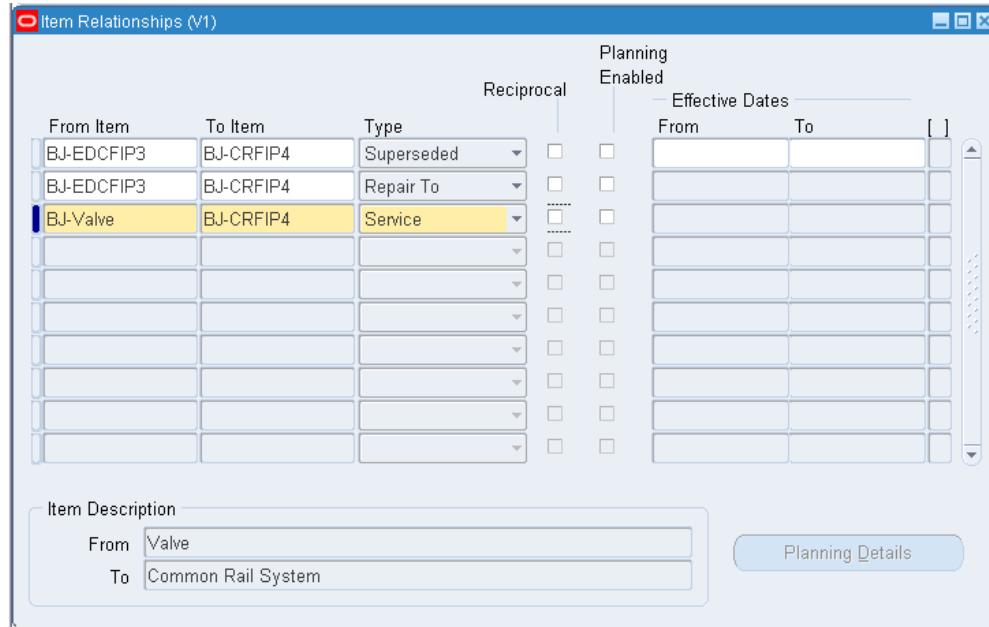


2. To create a new item relationship, click New.

To update an existing item relationship, enter the relationship query criteria, and then click Find.

**Tip:** If you would like to see existing relationships in both directions, leave the Direction field blank. If you would like to see all types of existing relationships, leave the Type field blank.

The Item Relationships window appears.



3. To create an Item Relationship, highlight a blank row and select an item to be replaced from the From Item list of values.
4. Select the superseding item from the To Item list of values.
5. Select the desired relationship from the following Type list of values.
  - Superseded. Creates a link in the supersession chain.
  - Repair To. Defines whether the From item can be repaired to a higher revision.
6. If the relationship is bilateral, that is, if the transformation can go in either direction, select the Reciprocal check box.
7. (Optional) Specify Effectivity Start and End dates.
8. Click Save.

## Destination Instance Setup Data

## Destination Instance Item Attributes

The following data is set up in the destination instance:

- Planning Time Fence Days

The Planning Time fence causes Service Parts Planning to enforce time fence control

for repair items within the repair lead time.

- **Intermittent Demand**

The history data series is assumed to be intermittent when the user chooses the Blended forecast method and the Intermittent Demand item attribute is set to Yes.

- **Service Level**

This manually sets service level, in percent, for an item and organization combination. This attribute causes the system to calculate a safety stock for this item to be stored at this location. See Evaluation of Multiple Service Levels Specified on Different Forms, page 11-5.

#### ***Destination Instance Item Attributes for Service Planning***

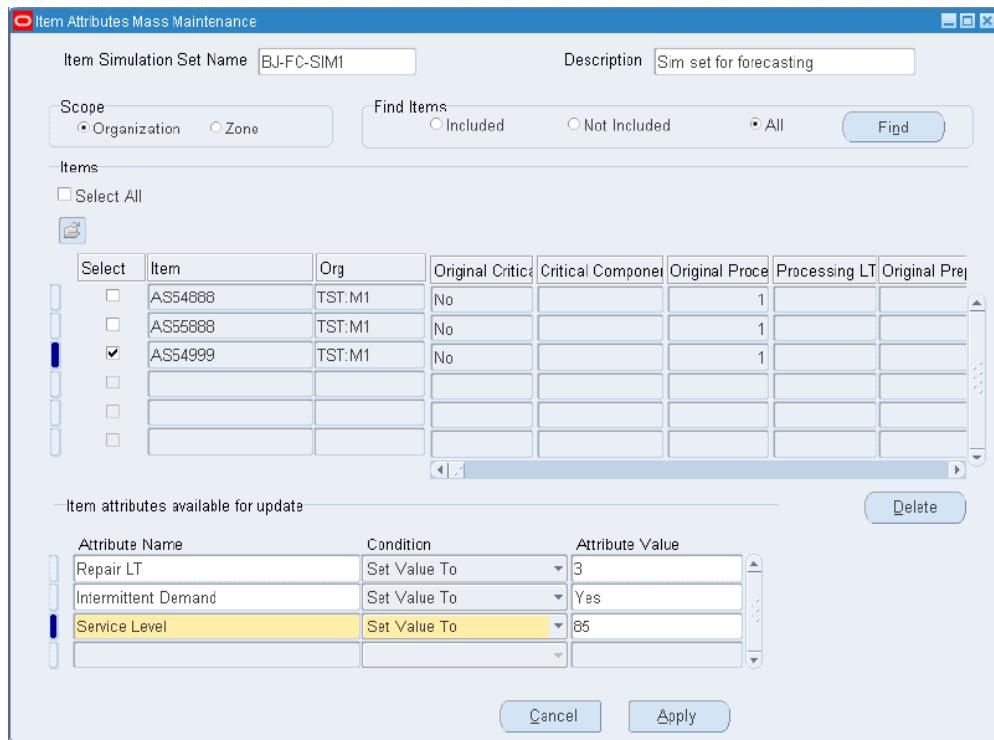
<b>Attribute</b>	<b>Description</b>	<b>Field Type</b>	<b>Default Value</b>
Repair Lead Time	This attribute, when set to equal the repair lead time, prevents Service Parts Planning from recommending changes to repair orders dated within this time period. *	Positive Integer	Null
Intermittent Demand	This attribute indicates that the demand history for this item contains many null values. This setting triggers special handling in forecasting.	Yes or No	No
Service Level	Manual setting triggers calculation of safety stock quantity corresponding to this specified service level.	Number	Null

**Note:** \* The repair lead time value can be set in the source instance and then collected, or set in the destination instance. The source instance item attribute appears on the Inventory Items MPS/MRP tab. The equivalent destination instance value is set as an item attribute on the destination instance Item Attributes Mass Maintenance window. When set in both places, for purposes of Service Parts Planning the destination instance value overrides the source instance value when collection runs.

# Defining Destination Instance Item Attributes

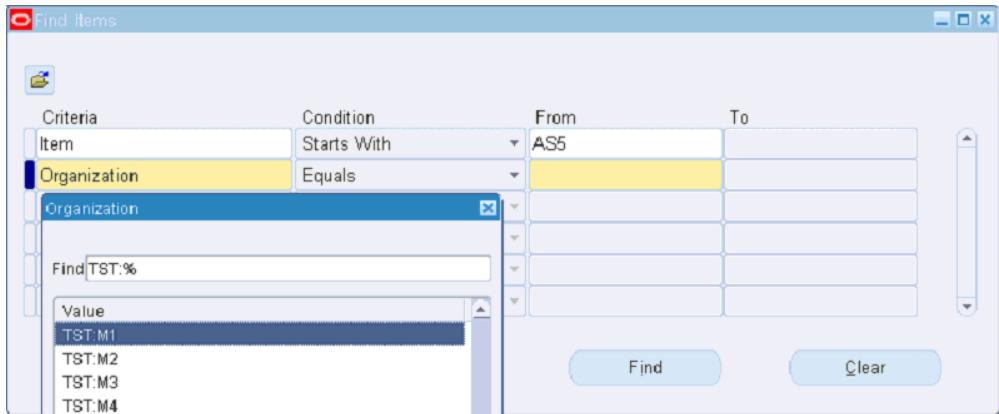
## To define destination instance item attributes:

1. From the Service Supply Chain planner responsibility, navigate to the Item Attributes Mass Maintenance window.  
Setup > Item Attributes Mass Maintenance.
2. In the header region, enter the Item Simulation Set Name. In the Scope region select the Organization radio button. In the Find Items region, select the All radio button.



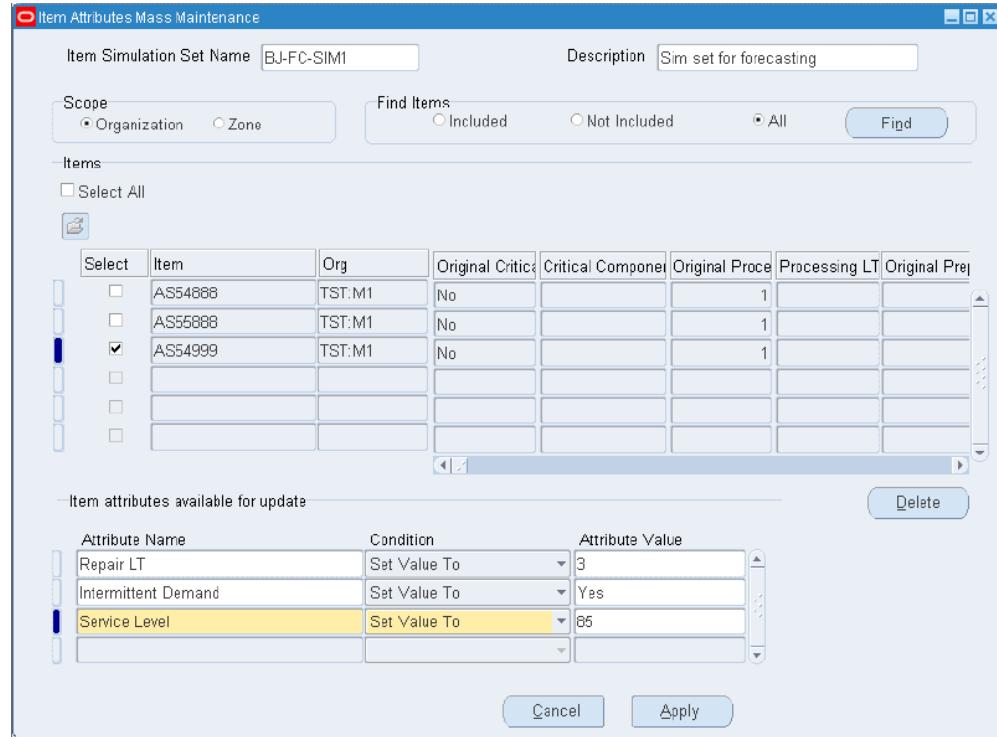
3. Click Find.

The Find Items window appears.



4. Specify criteria to retrieve the item-organization combinations for which you want to set these item attributes.
5. Click Find.

The Find Item window closes. Item and organization combinations matching the Find criteria are supplied on the Item Attribute Mass Maintenance window.



6. Select one or more items.
7. In the *Item attributes available for update* region, perform a query to retrieve the desired attributes.

#### Example

For example

- Repair LT
- Intermittent Demand
- Service Level

8. Click Apply.

See Creating Item Simulation Sets., page 8-15

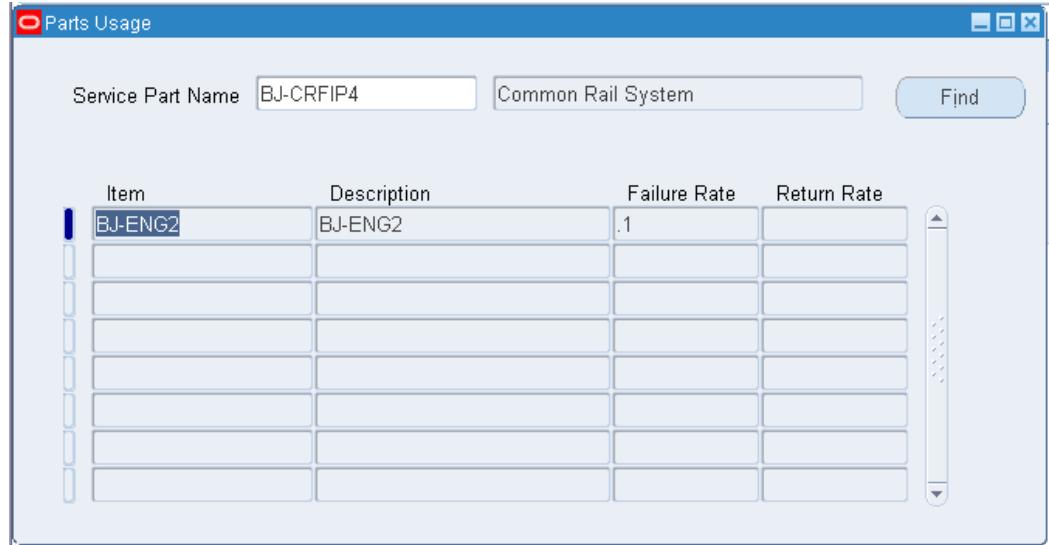
## Parts Usage View

The Parts Usage window provides a where-used view of all the products that consume a given service part during maintenance or service.

To view parts usage, from the Supply Chain Planner responsibility, navigate to the Parts Usage window, or to open the Parts Usage window in context of a selected item,

from the Planner's Worksheet click the Parts Usage icon.

Setup > Parts Usage



**Note:** You cannot create product-part relationships here. This relationship comes from the Failure Rates window.

## Setting up the Supply Chain

You can define the rules that govern the movement of goods throughout your supply chain. This network is the backbone of your material flow, and you can further control its behavior by defining a time-phased replenishment strategy. Oracle ASCP implements this strategy with sourcing rules and bills of distribution (BODs).

Sourcing rules and BODs both describe sourcing supply; in other words, for any organization, they answer the question Where do I get part A? (They never ask Where do I send part A?) Sourcing rules apply the answer to one organization or all the organizations in your enterprise. BODs define this behavior across multiple organizations (not just one or all).

### Defining Sourcing Rules

You can define sourcing rules that specify how to replenish items in an organization, such as purchased items in plants. Sourcing rules can also specify how to replenish all organizations, as when the entire enterprise gets a subassembly from a particular organization.

If there are conflicts in Sourcing, a predetermined hierarchy will resolve the sourcing conflict. For instance, if you assign a bill of distribution to an organization AUS that tells it to source the part from another organization NYC, you can still define a local

sourcing rule at organization AUS to source the part from yet another organization SAC. In this case, the local sourcing rule overrides the bill of distribution.

The planning assignment set holds information for:

- Sales order global distribution
- Organization-to-organization sourcing

Watch for conflicts between sourcing rules for external demands and sourcing rules for internal demands. For example:

- External demand for an item is sourced globally from either organizations M1 or M2. The sourcing rule is Transfer from with M1, M2. assigned at the item level
- Internal demand at organization M1 is sourced from organization M3. The sourcing rule is Transfer from with M3 assigned at the item/org level. The item/org assignment tells the planning engine that this sourcing rule applies to the sourcing for internal demand and not for the external demand.
- If you assign a sourcing rule for external demand at the item level, then you cannot assign a sourcing rule for internal demand at that level.

For more information on defining sourcing rules, see 'Defining Sourcing Rules, *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning Users Guide* in the *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning User's Guide*. For information on viewing sourcing rule assignments, see 'Viewing the Supply Chain, *Oracle Advanced Supply Chain Planning Implementation and Users Guide* .

Ship methods apply to Buy from and Transfer from sourcing rules. To create the ship methods:

- Navigate to Oracle Inventory > Shipping Networks
- Navigate to the detail region
- Navigate (M) Tools> Shipping Methods

## Defining BODs

You can define BODs that specify a multilevel replenishment network of warehouses, distribution centers, manufacturing centers (plants), and trading partners.

For more information on defining BODs, see 'Defining Bills of Distribution, *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning Users Guide* in the *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning User's Guide*. For information on viewing BOD assignments, see "Viewing the Supply Chain", *Oracle Advanced Supply Chain Planning Implementation and Users Guide*.

## Defining Assignment Sets

Once you have defined your sourcing rules and BODs, you must assign them to particular items and/or organizations. These assignments are grouped together in assignment sets. This is where various sourcing strategies define a particular supply chain network.

Each assignment set represents a selection of organizations and/or items you want planned. To influence the planning process, you must include an assignment set in your plan options.

In an assignment set, you can assign your sourcing rules and BODs at different levels, as follows:

- Item-Instance-Organization
- Category-Instance-Organization
- Category-Instance
- Item-Instance: If the Item field is empty, use the Reduce Criteria Window to restrict the selection.
- Instance-Organization
- Instance

These levels allow you to assign a replenishment rule to as many or as few items as possible. For example, a category of items could be defined as packaging material, and a sourcing rule that identifies the suppliers could be assigned to this category.

For more information on assigning a sourcing rule or BOD, 'Assigning Rules and Bills, *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning Users Guide* in the *Oracle Master Scheduling/MRP and Oracle Supply Chain Planning User's Guide*. For information on viewing sourcing rule and BOD assignments, see 'Viewing the Supply Chain, *Oracle Advanced Supply Chain Planning Implementation and Users Guide*.

## Assignment Hierarchy

In the preceding list of assignment levels, rows above override rows below. For instance, Item-Organization overrides Item.

For information on viewing assignments, see 'Viewing the Supply Chain, *Oracle Advanced Supply Chain Planning Implementation and Users Guide*.



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## Collecting Source Data

This chapter covers the following topics:

- Collecting Source Data
- Summary of Collected Source Data
- Collection Programs for Planning
- Starting Planning Data Pull and Planning ODS Load
- Collection Programs for Forecasting
- Collecting Service Parts Usage History – Field Service
- Collecting Service Parts Usage History – Depot Repair
- Collecting Service Parts Return History
- Collecting Service Products Return History
- Collecting Shipment History
- Collecting Install Base History
- Load History Data from Flat Files
- Purging Interface Tables
- Viewing Collected Data

### Collecting Source Data

Component architecture allows a single instance of Oracle Service Parts Planning to plan one or more transaction instances. The planning instance, also referred to as the planning server, can reside on the same instance as one of the transaction instances, or it can be an altogether separate instance. In either case, data to be planned is brought from the transaction instances to the planning server through a process called *Collection*.

Oracle planning uses a data store based on the planning data model that is exposed through interface tables. The data is pulled from the designated data sources into its

data store. Oracle Collections are responsible for synchronization as changes are made to the data sources. Thus, different business objects can be collected at different frequencies. Supplies and demands, which change frequently, can be collected frequently, while routings and resources, which change relatively less often, can be collected less frequently.

This chapter provides procedural steps for running the collections programs and viewing collected data. It describes the data collected for Service Parts Planning by the following programs:

- Collection Programs for Planning, page 3-4
  - Planning Data Pull
  - Planning ODS Load
- Collection Programs for Forecasting, page 3-8
  - Collect Service Parts Usage History – Field Service, page 3-8
  - Collect Service Parts Usage History – Depot Repair, page 3-10
  - Collect Service Parts Returns History, page 3-11
  - Collect Product Returns History, page 3-11
  - Collect Shipment History, page 3-12
  - Collect Installed Base History, page 3-13
  - Load History Data from Flat Files, page 3-13
- Viewing Collected Data, page 3-15

## Summary of Collected Source Data

Transactional data collected from the source instance by the Planning Data Pull program includes, but is not limited to:

- On-hand inventory
- Purchase orders
- Sales orders
- Repair orders (external and internal)

See Collecting Repair Orders – External and Internal, page 3-3.

In addition to transactional data, the other collection programs are started to:

- Collect the following item attributes as set up on the Organization Item window from the Manufacturing and Distribution Requirements responsibility. Inventory > Items > Organization Item > (T) MPS/MRP Planning.

See Defining Source Instance Item Attributes, page 2-3.

- Repair Program
- Repair Lead Time
- Repair Yield
- Prepositioning Point
- Collect the organization type (Depot Repair or Field Technician), as set up on the Organizations form from the Advanced Planning Administrator responsibility. Admin > Instances > (B) Organizations.

See Defining Organization Type, page 2-4.

- Collect the employee to subinventory association as set up on the Addresses and Subinventory window from the Spares Management responsibility. Spares Management > Setup > Addresses and Subinventories.

See Associating Field Technicians with Subinventories., page 2-5

- Collect the part condition value (Usable or Defective) as set up on the Addresses and Subinventory window from the Spares Management responsibility. Spares Management > Setup > Addresses and Subinventories.

See Setting the Part Condition Subinventory Type, page 2-6.

- Collect the item relationships Supersession and Repair to as set up on Item Relationships window from the Manufacturing and Distribution responsibility. Inventory > Items > Item Relationships.

See Defining Item Relationships, page 2-8.

## Collecting Repair Orders – External and Internal

To support multilevel reservation in Service Parts Planning, and to ensure that repair order documents are not cross-pegged, Collections obtains repair order detail for both internal and external repair orders. Collections brings repair order details over as reservations.

The Planning Data Pull program collects *external* repair orders from Spares Management. An external repair order pegs (or links) purchase orders to work orders to internal orders for transferring defectives. Spares Management manages these links as

described in Release Process, page 10-1 (for Service Parts Planning). Orders are appropriately reserved and pegged to retain the sanctity of the external repair order defined in Spares Management.

In the case of *internal* repair orders, the Planning Data Pull program collects the repair order and the open component requirements from the associated work orders, as long as the work order belongs to the same organization as the Depot Repair order.

For example, Depot Repair order #1121 is in organization M1, and three work orders are associated with it. Work order #1 and work order #2 are in organization M1, while work order #3 is in organization M2. In this case, Collections retrieves the open component requirements associated with work orders #1 and #2, and then rolls them up to a master work order that is analogous to the Depot Repair order.

## Related Topics

For more information about setup in the source instance, see Source Instance Setup Data, page 2-1.

# Collection Programs for Planning

## Planning Data Pull and Planning ODS Load

The Planning Data Pull program copies the appropriate data streams to the Planning Data Store (PDS) table. The Planning ODS Load program moves the data from the PDS table to the Operational Data Store (ODS) table that forms the basis for generating plans.

These two programs are typically started with a single request, and run sequentially without user intervention. Using two programs with an intermediate storage table provides flexibility for customization.

For example, custom collection programs could be used to collect shipment history, usage history, returns history, and failure rates from a legacy system. That data could be imported to the PDS table from flat files. As another example, when the implementation provides a custom data cleansing program, position that cleansing program in the request sequence to run after the Load Transaction Data program, and before the Planning ODS Load program. This strategy manipulates collected data in the PDS before it is moved to the ODS.

**Important:** It is important that collections run from Advanced Supply Chain Planning (ASCP) or Distribution Requirements Planning (DRP) responsibilities are identical to those run from SPP responsibilities. This is especially true for implementations that are using SPP in conjunction with other APS products.

## Standard Collections

You start the Standard collections program from the Service Supply Chain Planner responsibility > Collections > Standard Collections to collect data from the source to the PDS, and then immediately move that data to the ODS. These programs have been enhanced to collect additional data, such as item relationships, needed for Service Parts Planning.

Using the standard collections process, you can manually run three types of collection methods, including a complete refresh, a net change refresh, or a targeted refresh on specific business entities. You set parameters to specify which data types to collect, whether to purge previously collected data, whether to analyze staging tables, and so on.

## Continuous Collections

You start the Continuous Collections program from the Service Supply Chain Planner responsibility > Collections > Continuous Collections. The continuous collections process is an automated process that efficiently synchronizes the data on the planning server by looking up the sources. If you opt for continuous collections, the system automatically determines the type of collection that needs to be run on entities selected by you. The continuous collections process requires less user intervention than does standard collections.

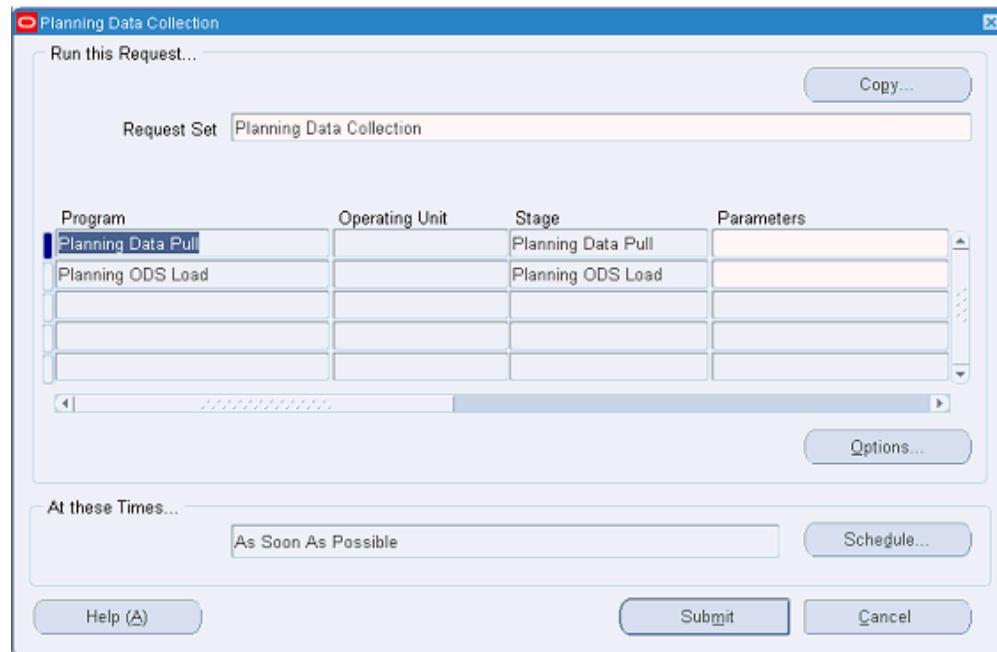
## Related Topics

For more information on running collection programs, see the "Running Collections" chapter in the Advanced Supply Chain Planning User Guide.

## Starting Planning Data Pull and Planning ODS Load

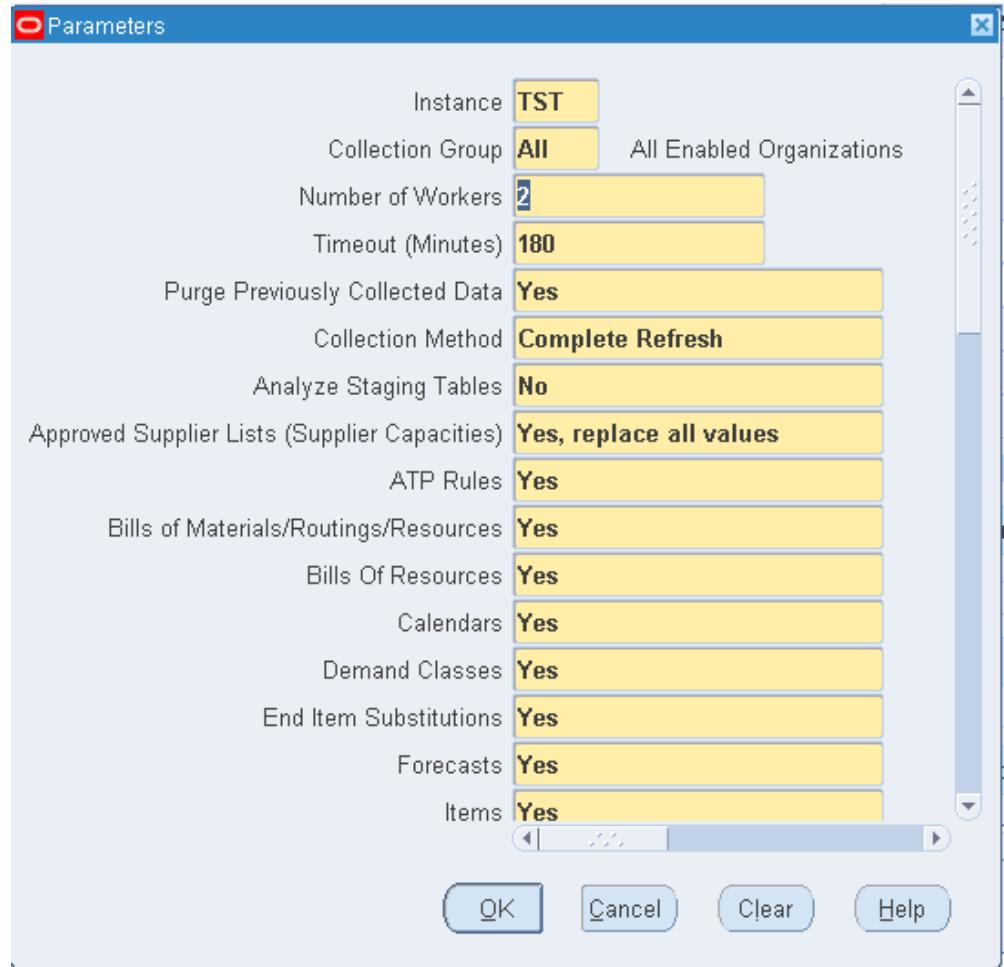
### To start planning data pull and planning ODS load programs:

1. From the Service Supply Chain Planner responsibility, navigate to the Planning Data Collection window.  
Collections > Standard Collections  
The Planning Data Collection window appears.



2. Click the Parameters field.

The Parameters window appears.



3. Set the program parameters

#### ***Planning Data Pull Parameters***

<b>Parameter / Description</b>	<b>Value</b>
Instance This parameter identifies the collection target source instance.	Enter the source instance ID.
Collection Group This parameter identifies a named group of organizations. To set up a collection group, from the Advanced Planning Administrator responsibility, navigate to the Instances Form. Click Organizations, and then set the Collections Group column.	All enabled organizations

Parameter / Description	Value
Number of Workers	2
Timeout Minutes	180
Purge Previously Collected Data	Yes
Collection Method	Complete Refresh
Analyze Staging Tables	No
and so on	

4. Click OK.
5. Click Submit

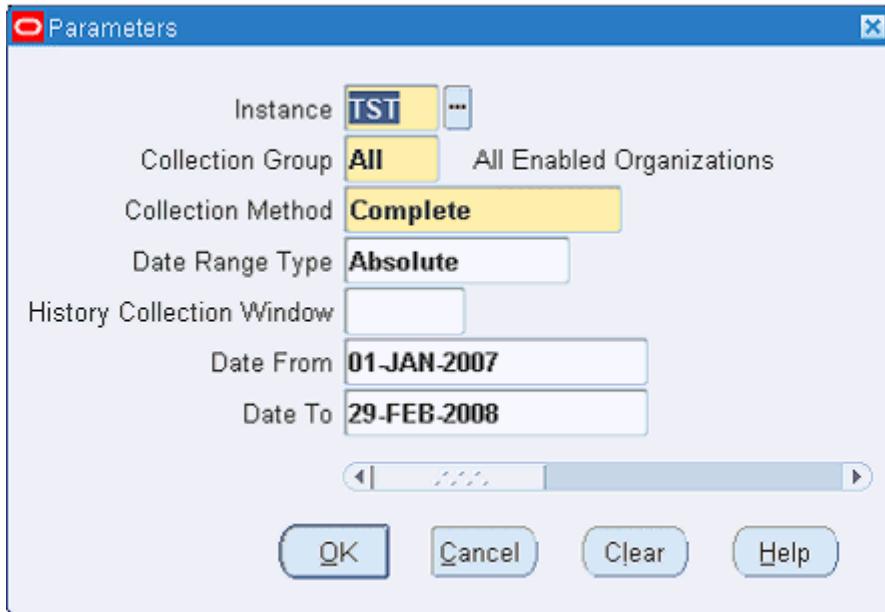
## Collection Programs for Forecasting

This section describes collection programs available for collecting various data history streams. For each collection, you navigate to the appropriate request form, select parameters, and then submit your request.

## Collecting Service Parts Usage History – Field Service

### To collect field service usage history:

1. From the Service Supply Chain Planner responsibility, navigate to the FIELD\_SERVICE window..  
Collections > Oracle Systems > Service Parts Usage History – Field Service  
The FIELD\_SERVICE window appears with the Name: Collect Service Parts Usage History – Field Service.
2. The Parameters window opens in front of the requests window. If you close this window, you can reopen it by clicking the Parameters field.



3. Complete the Parameters information as explained in the History Collection Parameters, page 3-9 table.
4. Click OK.
5. On the Request form, click Submit.

#### ***History Collection Parameters***

Parameter	Description	Value
Instance	Source (target) instance from which the data stream is to be collected.	LOV
Collection Group	You can run collections for a named group of organizations. The default value is All enabled organizations.	All
Collection Method	The default collection method is Complete. This method collects source data regardless of whether it has changed.	LOV Complete Net Change

Parameter	Description	Value
Date Range Type	When this parameter is set to Absolute, the Date From and Date To fields define the time period for which history data is collected.	LOV Absolute Rolling
	When this parameter is set to Rolling the History Collection Window field value defines the number of days for which history data is collected.	
History Collection Window	In case Date Range Type is set to Rolling, the History Collection window specifies the number of days (from the current date) for which data is collected.	Number
Date From	Start date of collected data history stream.	Date
Date To	End date of collected data history stream.	Date

**Note:** You specify the date range for historical data in the Parameters form. While the system is collecting history, the same date range applies across all items and data streams. Collections obtained at the day level are appropriately aggregated to buckets, depending on the Plan Option parameters.

## Collecting Service Parts Usage History – Depot Repair

This program collects all components issued to work orders in the same depot repair organization into the planning data store.

**Note:** To support the case where the internal depot repair organization is the same as a manufacturing organization, service part item numbers are assumed to differ from the component item numbers used in production.

### To collect depot repair usage history:

1. From the Service Supply Chain Planner responsibility, navigate to the Collect Service Parts Usage History – Depot Repair window.

Collections > Oracle Systems > Service Parts Usage History – Depot Repair

2. Complete the Parameters information as explained in the History Collection Parameters, page 3-9 table.
3. Complete the additional parameter: Include Accounting classes.
4. Click Submit.

## Collecting Service Parts Return History

### To collect parts return history:

1. From the Service Supply Chain Planner responsibility, navigate to the SERVICE\_PARTS\_RETURN\_HISTORY window.

Collections > Oracle Systems > Service Parts Return History

The Collect Product and Service Part History window appears, with the Name Collect Product and Service Part Return History.

2. The Parameters window opens in front of the requests window.
3. Complete the Parameters information as explained in the 'History Collection Parameters, page 3-9' table.
4. Click OK.
5. On the Request form, click Submit.

## Collecting Service Products Return History

### To collect product returns history:

1. From the Service Supply Chain Planner responsibility, navigate to the Collect Product and Service Part History window..

Collections > Oracle Systems > Product Return History

The Collect Product and Service Part History window appears.

2. Complete the Parameters information as explained in the History Collection Parameters, page 3-9 table.
3. Select the Include RMA Types list of values icon.

The Include RMA Types window appears.

4. Select an RMA Type from the list of values (LOV).
5. Click OK.
6. On the Collect Product and Service Part History window, click Submit.

## Collecting Shipment History

### To collect shipment history:

1. From the Service Supply Chain Planner responsibility, navigate to the Collect Shipment History window.  
Collections > Oracle Systems > Shipment History  
The SHIPMENT\_HISTORY window appears, with the Name: Collect Shipment History.
2. The Parameters window opens in front of the requests window.
3. Complete the Parameters information as explained in the 'History Collection Parameters, page 3-9' table.
4. Choose Yes or No to indicate whether to collect the following data streams:
  - Booking History – Booked Items – Booked Date
  - Booking History – Booked Items – Requested Date
  - Booking History – Requested Items – Booked Date
  - Booking History – Requested Items – Booked Date
  - Shipment History – Shipped Items – Shipped Date
  - Shipment History – Shipped Items – Requested Date
  - Shipment History – Requested Items – Shipped Date
  - Shipment History – Requested Items – Requested Date
  - Collect Internal Sales Orders
5. Choose whether to
  - Collect All Order Types
  - Include listed Order Types

- Exclude listed Order Types

6. Choose whether to Launch Download
7. Click OK.
8. On the Request form, click Submit.

## Collecting Install Base History

Install Base history can be used to track the products or assets at a customer site, and can represent the total number of serviceable products in the field. Retirements of products must be taken into account to arrive at accurate install base numbers.

### To collect install base history:

1. From the Service Supply Chain Planner responsibility, navigate to the Install Base History window.  
Collections > Oracle Systems > Install Base History  
The INSTALL\_BASE\_HISTORY window appears, with the Name: Collect Install Base History.
2. Complete the Parameters information as explained in the 'History Collection Parameters, page 3-9' table.
3. Click OK.
4. On the Request form, click Submit.

## Related Topics

See Spare Parts Demand Forecasts Based on Product Population, page 4-10.

## Load History Data from Flat Files

### To load history data from flat files:

1. From the Service Supply Chain Planner responsibility, navigate to the Load SRP Streams window.  
Collections > Legacy Systems > SRP Streams – Self Service  
The Load SRP Streams window appears.
2. Browse to the flat file.

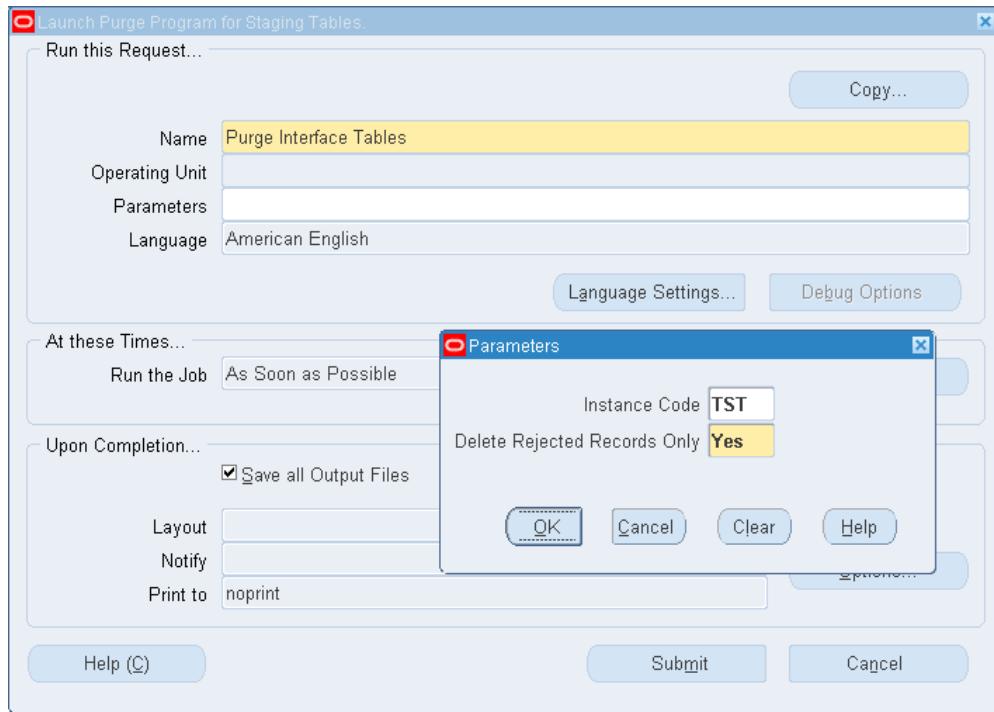
3. Select the instance where the flat file is located from the Instance LOV.
4. Click Start Load Now.

## Purging Interface Tables

### To purge interface tables:

1. From the Service Supply Chain Planner responsibility, navigate to the Collections > Oracle Systems > Purge Interface Tables

The Parameters window opens in front of the Launch Purge Program for Staging Tables window.

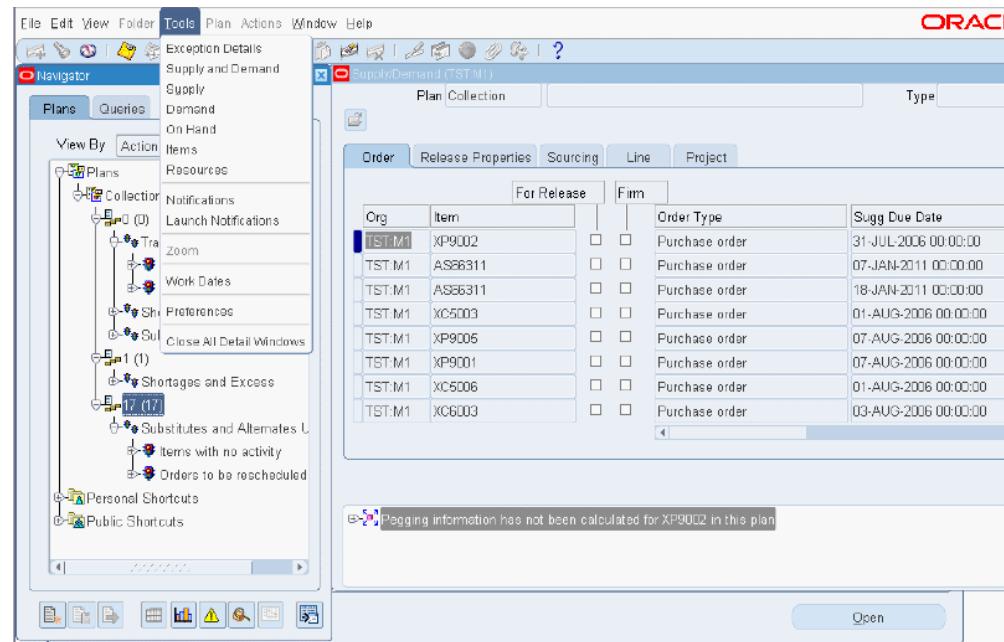


2. Select the Instance Code and specify whether you want to delete only the rejected records.
3. Click OK to close the Parameters window.
4. On the Launch Purge Program for Staging Tables window, click Submit.

## Viewing Collected Data

### To view collected data:

1. From the Supply Chain Planner responsibility, open the Navigator window.  
Collections > View Collected Data
2. If the Organizations window appears, select the organization, and then click OK.  
The Navigator window opens to either the Plans or Queries tab, depending on the default tab set in User Preferences.
3. Select the Plans tab, if it is not already open.
4. Select View by Actions.
5. On the Plans tab, click the "+" signs to expand Plans > Collection.
6. Highlight a version. Select Supply and Demand from the Tools menu.  
The Find Supply/Demand window appears.
7. Enter query criteria. For example, set Org equal to TST:M1.
8. Click Find.
9. The Supply Demand window opens and is populated with data collected from the selected organization.



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## Inline Forecasting Concepts

This chapter covers the following topics:

- Overview – Inline Forecasts
- Spare Parts Demand Forecasts Based on Shipments
- Spare Parts Demand Forecasts Based on Usage
- Spare Parts Supply Forecasts Based on Returns
- Spare Parts Demand Forecasts Based on Product Population

### Overview – Inline Forecasts

The spares forecast, whether from Enterprise Resources Planning (ERP), or from demand planning systems, or generated within SPP can be entered to planning as a demand schedule. Generating forecasts within SPP is termed *inline forecasting*.

### Supported History Data Streams

Many variables such as usage pattern, asset population, service product life cycle, and failure rate affect demand. Oracle Service Parts Planning supports forecasts based on the following data streams:

- Spare part *shipment* history
- Spare part *usage* history
- Spare part *returns* history
- Spare *product* returns history
- Product *population* and failure rates

### Supported Inline Forecasts

Forecast Base	Forecast Source	Forecast Level *
Shipments	Outbound shipments from distribution organizations (includes both internal sales orders and sales orders)	Local
Usage	Field technician usage	Global – Zone
Usage	Depot Repair usage	Local
Returns	Field technician returns	Global – Zone
Returns	Return Material Authorizations (RMA) in Order Management for service parts	Local
Returns	RMA in Order Management for products	Local
Population	<i>Projected</i> Oracle Install Base population with applied part failure rate	Global
Population	<i>Current</i> Oracle Install Base population and product sales forecast, with applied part failure rate	Global

\* Forecast level –

- Generate the *local* forecast for an item if the item has a forecast policy assigned at the organization level.
- Generate the *global* forecast for an item if the item has forecast policy assigned at the zone level
- Generate both local and global forecasts for an item, if the item has forecast policies assigned to both *organization* and *zone* levels. Use this approach to generate forecasts based on complete data when one service operation offers repair services by field technicians (collecting field spares usage) and repair services at internal depots (collecting the history of issues to internal repair orders).

## Spare Parts Demand Forecasts Based on Shipments

You specify which historical data stream to use as the basis of the forecast in the

Forecast Rule. In planning, internal sales orders (outbound shipments) to organizations that *are not* included in the Plan Options, and shipments to field technician organizations, are considered as shipment history. Such shipments typically include those outbound from a distribution organization to the field organization, or where applicable, directly to external customers.

To avoid double counting, the history stream includes shipments to field technician organizations, but not to distribution organizations. In the case in which the scope of the plan is limited to only the central warehouse, then the history basis should include all outbound shipments from the central warehouse.

### **Data collection.**

SPP collects two data streams for shipment-based forecasts:

1. Internal sales order outbound shipments, for which the destination organizations are field technician organizations. The field technician organizations are specified in the Collections setup window. Note that outbound shipments that are not shipped to the field organizations should not be part of the history.

The following information is used as part of the history:

- Item, ship date, source organization, destination organization, quantity shipped, and unit of measure (UOM).
- Internal sales orders (ISOs) and their corresponding internal requisitions are collected. ISOs do not have a destination organization. The Ship to is for an external location. Thus, in order to determine the destination organization for an ISO, it is necessary to link to the internal requisition. The organization in which the internal requisition is created becomes the destination organization.

Data stream definition details

- Source Type: ERP
- Type of data: quantity
- Dimension levels
- Product: Item
- Ship From: Organization
- Ship To: Organization (local forecast based on the source organization)
- Geography: NA
- Time: At day level only

- Make sure that the *technician* organizations *are not* named as planned organizations in the plan options. If they are planned, then they are considered as *distribution* organizations, and the corresponding history is ignored for forecasting purposes.
- Similarly, if any of the distribution organizations from which history has been collected are not planned in the plan, then such history data is also omitted.

For example, the central distribution center has outbound shipments to field technician organization, and the history has been collected. However, in the plan options, the central distribution center is not being planned. Then the corresponding history of the central distribution center is not considered for forecasting purposes.

2. Sales orders to external customers based on the shipment history.

The following information is used as part of the history:

- Item, Organization, ship date, quantity shipped, and UOM  
Data stream definition details
- Source Type: ERP
- Type of data: quantity  
Dimension levels
- Product: Item
- Ship From: Organization
- Ship To: Organization
- Time: At day level only

## Spare Parts Demand Forecasts Based on Usage

### Forecasts Based on Field Technician Usage

Historical material usage data captured as part of the Oracle Spares Management Debrief process is used to project the future parts requirements for technician organizations. Spare part item historical usage from technician organizations is calculated at the *zone* level. The zone is based on the location tied to the technician trunk

stock (or subinventory) from which the field service usage occurs.

For supply planning, these forecasts are considered as *global* forecasts. You specify global sourcing rules to push this forecast to the appropriate replenishing organization.

#### **Data collection**

Service part usage history is collected from Oracle Field Service usage transactions created in the Spares Management Debrief process.

This process collects the following information:

- Service part replaced (Item ID)
- Date replaced
- Quantity replaced
- Customer location (at zone level)  
Data stream definition details
- Source Type: ERP

Field Service: Collect only 'field service usage transactions' created through the Oracle Spares Management Debrief process.

- Type of data: Quantity  
Dimension levels
- Product: Item
- Ship From: Organization
- Ship To: Zone
- Time dimension: At day level only

## **Forecast Based on Depot Repair Usage**

Spares requirement forecasts can also be based on the historical consumption of parts in depot repair organizations by collecting the history data of component issues against repair work orders at the depot organization. Such forecasts are generated at the depot *organization* level.

#### **Data collection**

Service part usage history is collected from Oracle Depot Repair material requirements for repair orders or Java Technology Framework.(JTF) tasks.

The following information is collected:

- Service part replaced (Item ID)
- Date replaced
- Quantity replaced
- Customer location (at zone level)

Data stream definition details

- Source Type: ERP

Depot Repair: Collect the material requirements and job quantities for repair jobs. Repair jobs are non standard discrete jobs created in Work in Process (WIP) that are based on repair orders in Oracle Depot Repair. Also collect material requirements from JTF tasks.

- Type of data: quantity

**Dimension levels:**

- Product: Item
- Ship From: Organization
- Ship To: Organization level
- Time dimension: At day level only

## Spare Parts Supply Forecasts Based on Returns

The seeded methods for calculating returns include:

- Field Service returns (as part of the Debrief process).
- Return Material Authorizations (RMAs).

Returns-based forecasts capture the history of service part and product returns from Oracle Field Service and from Order Management RMAs. That information forms the basis for projecting future returns. Thus, forecasts for total returns depend on:

- Returns of service parts from field technicians
- Direct returns of service parts from customers, through the RMA process
- Direct returns of products from customers, through the RMA process.

## Field Service Returns

Field service returns are fed into the planning process as a *global* returns forecast at the *zone* level. Planners can assign the Return to sourcing rule to push the field service part returns forecast to the appropriate returns organization according to the business process.

### Data collection

Only field service recovery transactions created through the Field Service Debrief process are collected.

Data stream definition details:

- Source Type: ERP
- Type of data: quantity

Collect the following information from Field Service tables

- Defective service part (Item ID) returned
- Return date
- Quantity returned
- Customer location (at zone level)

Dimension levels:

- Product: Item
- Ship from: Organization level
- Ship to: Zone level
- Time: At day level only

## Spare Part Returns Through Order Management RMAs

Service parts can also be returned directly through the RMA process. Defective spare parts returned from customers through the Order Management RMA process are entered to the planning process at the repair organization.

### Data collection

Use the Include RMA Type field to select the types of RMAs to be collected:

- All (default): Returns for all RMA types are collected
- Replacement, Receipt and No Credit, Receipt and Credit, and Repair RMA

- RMAs of the type called RMA with Credit Only are not collected.

Data stream definition details:

- Source Type: ERP
- Type of data: quantity

The following data is collected from Oracle Order Management as part of the direct returns:

- Defective service part (Item ID) returned
- Organization
- Customer location
- Return date (Date on which the RMA is created)
- Quantity returned

Dimension levels:

- Product: Item
- Ship from: Organization (local forecast)
- Ship to: Organization (local forecast)
- Time: At day level only

**Note:** Returns orders are sales orders with Line Type Return and negative quantities.

## Product Returns Through Order Management RMAs

In many cases, customers directly return products through the Order Management RMA process. These products yield defective service parts when disassembled or dismantled for repair. This stream of defective parts is considered while forecasting the returns. The amount of service parts yielded by a *product* depends on the average failure rate of the service *parts* within the given product. The failure rate for the product and service part combination is determined as described in the procedure: Setting Up Install Base, Failure Rate, and Retirement Rate, page 5-8.

The history of *product* returns is collected and projected. The projected product returns are then multiplied by the service part-specific failure rate to determine the projected service *part* returns. The total returns for a given service part is equal to the sum of all the returns from the corresponding products with which product and service part

relationships are established.

## Solution Overview

The solution consists of the following components:

1. Collection of product returns history – Order Management order type: RMA.
2. Projection of the future product returns, based on history. The forecasting method is specified in the forecasting rule associated with the product.
3. Multiplication of the projected *product* returns by the failure rate, to project the quantity of *service part* returns.

Returns for service part (i) in bucket (t) =  $\text{SUM}_{j=1, n} (\text{Returns for product (j) in bucket (t)} * \text{failure rate (i,j)})$

Where:

(i) is the service part belonging to product (j)

n is the number of products with which the service relationship is enabled (as defined in the setup > product population forecasting parameters form)

Assumption:

The defective service parts are assumed to be available in the same bucket as that of the returned Product. In reality, there is a lag between the return of the product and the availability of the service part. However, for simplicity, the events are assumed to occur simultaneously.

You specify the following two major components as part of the forecasting rule, in the Usage/Shipment/Returns tab:

- Select the history basis Product returns
- Specify forecast parameters, such as Forecast method and Horizon for projecting future product returns.

## Data collection

Use the Include RMA Type field to select the types of RMAs to be collected:

- All (default): Returns for all RMA types are collected
- Replacement, Receipt and No Credit, Receipt and Credit, and Repair RMA
- RMAs of the type called 'RMA with Credit Only' are not collected.

Data stream definition details

- Source Type: ERP
- Type of data: quantity

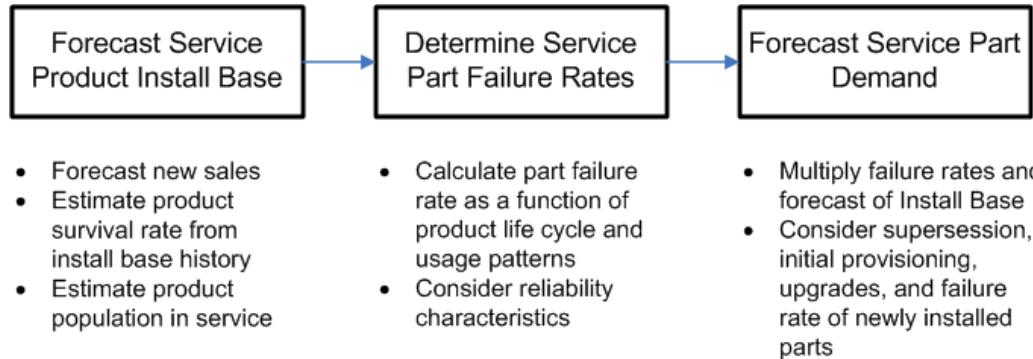
#### Dimension levels

- Product: Item
- Ship from: Organization
- Ship to: Organization
- Time: At day level only
  - If the return history is collected for an item that is a *product*, as defined in the service relationship, and if the forecasting rule has product returns as the history basis, then product return-specific calculations are performed. If the return history is collected for a *service part*, then the item return history is projected.
  - The returns forecast can be made up of field technician returns, direct service part returns, and yields from direct product returns. However, the breakdown of each of these streams is not visible to the user. The user sees one number that is the aggregation of all the return sources. The product population-based returns (return rate forecast) is visible as a separate row.

## Spare Parts Demand Forecasts Based on Product Population

If the failure rates of service parts are known along with the overall product population, you can use that information as a basis of forecasting the demand and supply of the service parts. The overall product population is composed of the current products in service and future or anticipated products to be serviced. To determine the product population accurately, retirements (when products are taken out of service) also need to be taken into consideration. Failure rates are typically age dependent, and can vary according to the product's life cycle stage.

## Solution Overview



## Main Components

The main components of Product Population-based forecasts are:

- Oracle Install Base history: Time-phased Install Base history collected from Oracle Installed Base is used in calculating the current installed base and failure rates.
- Current Install Base population: This constitutes the total of active currently installed products. This information is obtained in one of two ways:
  - User specified: The user provides a value for the currently installed base, or
  - Calculated from Oracle Install Base: This value is calculated from the collected Oracle Install Base population history stream.
- Projected product population: This population is based on the installed base information, and is calculated according to the following equation:  
$$\text{Installed base (t)} = \{\text{Installed base (t-1)} + [\text{sales forecast (t)} * \text{service market share}] * \text{periodic survival rate}\}$$
Where Installed base (t) represents the current installed base value.
- Failure rates: This denotes the average periodic failure rate of the product population. You specify an average (non time varying) failure rate for a product and service part combination.
- Determining the projected demand for service part: Once the projected population and the failure rates are known, the demand for the service part for a time period (t) can be projected:

Projected demand for service part (i,t) =  $\sum_{j=1, n} \text{(projected product population (j,t)} * \text{failure rate (i,j)})$

where,

$i$  is the service part being used in product  $j$

$n$  is the total number of products using service part  $i$

## Forecast Service Product Demand Based on Install Base

### Oracle Install Base history

Oracle Install Base can be used to track products and assets at a customer site, and can represent the total number of serviceable products in the field. Retirements of products need to be taken into account to arrive at accurate install base numbers.

#### **Example: Installed Base for Printer A**

Year	2003	2004	2005	2006	2007
New installed base	100	120	110	125	120
Retirements	0	0	0	50	100
Net installed base	100	120	110	75	20

#### Data stream definition

- Name: Install Base History
- Source Type: ERP
- Type of data: quantity
- Allocation: not allowed

#### Dimension levels

- Product: Item
- Ship From: Not applicable
- Geography: Not applicable
- Time: Two dates exist—installation date and end active date
- Sales Channel, Sales Rep, and User-defined dimensions: Not applicable

#### Data collection

The following information is collected from Oracle Install Base tables:

- Product
- Owner party ID
- Installation date
- End active date (decommissioned on this date)
- Quantity

***Install Base example data:***

Product	Owner Party ID	Installation Date	End Active Date	Quantity
Printer AT	Zinc Inc.	01-APR-2007	None	7
Printer AT	Zinc Inc.	04-JAN-2006	31-JAN-2007	1
Printer AT	Zinc Inc.	04-JAN-2006	10-DEC-2006	1
Printer AT	Zinc Inc.	04-JAN-2006	None	3
Printer AT	Red Inc.	07-APR-2007	None	5
Printer AT	Internal	05-JAN-2007	None	2
Printer AT	Red Inc.	None	None	1
Printer AT	Red Inc.	15-FEB-2007	None	5

Collection is done for installed base at external customer sites only. When a customer name is associated to the product (Owner party ID other than Internal as defined in install parameters), it becomes part of the external installed base. Further, if the installed base date is blank or null, then the product is possibly returned for major repair, or has been returned permanently. Such rows are ignored.

When lot control is enabled to track the install base, the quantity can be more than 1. When a product (an item instance) of the lot is retired, the lot is split in Install Base such that only the retired product bears the end active date. In the example data, rows 2, 3, and 4 represent a lot quantity of five, two of which have been retired.

Collections brings both active and retired install base; however, the retired install base is filtered out. The following table shows whether the data rows are filtered out:

**Collected Install Base example data, with History start date 01-JAN-2007.**

	Product	Owner Party ID	Installation Date	End Active Date	Qty	Filtered out? (Yes or No)
1.	Printer AT	Zinc Inc.	01-APR-2007	None	7	No
2.	Printer AT	Zinc Inc.	04-JAN-2006	31-JAN-2007	1	No
3.	Printer AT	Zinc Inc.	04-JAN-2006	10-DEC-2006	1	Yes. Product retired before history start date.
4.	Printer AT	Zinc Inc.	10-JAN-2007	None	3	No
5.	Printer AT	Red Inc.	07-APR-2007	None	5	No
6.	Printer AT	Internal	05-JAN-2007	None	2	Yes, not external
7.	Printer AT	Red Inc.	None	None	1	Yes, possibly returned
8.	Printer AT	Red Inc.	15-FEB-2007	None	5	No

Finally, the information appearing in the Forecast Analysis View is aggregated at the product level, and bucketed according to the forecast bucket size specified in the Plan Options. For example:

- Forecast History bucketing period: Month
- Calendar: Gregorian
- History start: 01-JAN-2007
- History end: 31-MAY-2007

The preceding history information is summarized into monthly buckets as shown:

<b>Product</b>	<b>Quantity</b>	<b>Period</b>	<b>Comments</b>
Printer AT	4	JAN-2007	Product is assumed to retire instantaneously at the end of the period.
Printer AT	8	FEB-2007	
Printer AT	8	MAR-2007	Same as February, because there were no new installations or retirements
Printer AT	20	APR-2007	
Printer AT	20	MAY-2007	

See Forecast Analysis View, page 9-18.

#### **Collection Parameter**

The parameter Install base history appears on the Collection window with the LOV value Yes or No, to provide flexibility to collect or not collect the Install Base history.

#### **Current Installed Base Population**

The currently installed base population acts as the basis for the projected installed base. If Oracle Install Base information is available, it is computed as follows:

Current install base = (total install base population to date – retirements to date)

<b>Year</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>Total</b>
New installed base	100	120	110	125	120	575
Retirements	0	0	0	50	100	150

The current installed base in this example is equal to  $(575 - 150) = 425$ .

If the Oracle Install Base information is not available, you can enter this information directly through the user interface, or by using mass upload capabilities.

#### **Projected Product Population**

The projected product population is typically based either on the Install Base history or on the current Install Base plus sales forecast.

- Projecting product population based on Install Base history:

You can choose to project the Product Population based on the Install Base History. In that case, you select the appropriate forecast method, and set the horizon to be considered for forecasting.

- Projecting product population based on sales forecast:

Because not all product sales translate into a service contract, you can adjust the sales forecast to provide an estimate of the service market share. A factor called the Service Adjustment Factor is provided to adjust the sales forecast accordingly. The projected product population is computed as follows:

Installed base (t) = [installed base (t-1) + sales forecast (t) \* service adjustment factor] \* (1 – retirement rate)

**Note:** Installed base (t = 0) is equal to the current installed base.

#### **Estimating sales forecast:**

If the sales forecast is already available, you can use it directly. Two available options are:

- Flat file loads (presented as a demand schedule)
- Demand planning and ERP forecasts.

Optionally, you can directly enter the projected population (if known), set the service adjustment factor to 1 (or leave it blank), and set retirement rate to zero (or leave it blank).

If the sales forecast is not available, you can generate the sales forecast, and use it in the calculation of the projected product population. This generated sales forecast is solely for the purpose of calculating the projected product population, and is not available to be viewed in the user interface or available for subsequent use.

You can collect sales order booking history and shipment history as part of the collection parameters. The data is collected at the day level for the range specified in the global parameters.

The following sales order data is collected:

- Item
- Instance and Organization
- Booked date
- Shipped date
- Quantity

- Unit of measure

The sales forecast is done according to the specified forecasting parameters. The history range, forecast horizon, calendar, and bucket are selected from the Horizon Details tab of the Forecast Rule window. You can specify whether booking history or sales history should be used. The forecasting engine considers the appropriate dates.

Forecasting is done at the organization level only (local forecasts). After the system generates local forecasts, the information is aggregated at the global item level. That is, all the organization level quantities are summed for a given item. Once the sales forecast at the global level is determined, subsequent calculations project the installed base.

### Retirement Rate

Products are retired after their useful life and taken out of the installed base. Thus you must account for the retirement rate in order to determine the projected population accurately. It is common business practice to keep track of the average periodic product retirement rates. This is typically expressed in terms of a percentage of the overall product population that retire during a given time period (or bucket).

The retirement rates must be entered at the same time bucket level as that of the product population forecast. The retirement rates are non time varying. This means that the same rate applies for the entire forecast horizon.

For example:

- Product: Printer A
- Service Adjustment factor: 60%
- Retirement rate: 10% (therefore, the survival rate is 90%)
- Current installed base: 100

Year	2006	2007	2008
Sales Forecast	240	280	350
Serviceable products (after applying the 0.6 service adjustment factor)	144	168	210
Total serviceable products (after adding the previous period's 100 installed base)	244 (144+100)	387 (168+219)	558 (210+348)
Projected Installed base (after applying the 10% retirement rate)	219	348	502

## Determine Service Part Failure Rates

Failure rate information can be based on many factors such as usage, product life-cycle patterns, and reliability characteristics. This section focuses on usage-based failure rates obtained directly from users.

### User-Specified Failure Rates

In cases in which the install base information is inadequate, you can directly enter the average periodic failure rate for a product and service part combination. For example:

- Printer A - Cartridge x: average failure rate is 10.7% per time bucket
- Printer B - Cartridge x: average failure rate is 1.73% per time bucket

The example shows that a service part, such as cartridge x, can have a different failure rate in the different products that the service part is assigned to. The Failure Rate window accessed by navigating Service Parts Planning > Setup > Failure Rate, enables you to set up failure rates for product and part combinations.

The failure rate is expressed as an average percentage of the population that fails per unit of time. The unit of time must be equivalent to the product population forecast time bucket size. In other words, if the product population forecast is in *weekly* buckets, then the failure rate is expressed in percent *per week*. The average failure rates are non-time-varying, meaning that the specified failure rate applies for the entire forecast horizon.

See Setting Up Install Base, Failure, Return, and Retirement Rates, page 5-8.

## Forecast Service Part Demand:

Demand for service parts vary with the installed base population and service part-specific average failure rates, according to the following equation:

Projected demand for service part (i,t) =  $\text{SUM}_{j=1,n} (\text{projected product population (j,t)} * \text{failure rate (i,j)})$

where,

*i* is the Service part being used in product *j*

*n* is the total number of products using service part *i*

Continuing the previous example,

- Cartridge x is used in both Printer A and Printer B
- Average failure rate for Printer A – Cartridge x: 0.107
- Average failure rate for Printer B – Cartridge x: 0.0173

Year	2006	2007	2008
Projected Printer A Install Base	219	348	502
Cartridge x – Printer A projected failures	23	36	53
Projected Printer B Install base	527	658	807
Cartridge x – Printer B projected failures	9	11	13
Total cartridge x projected demand	32	47	66

## Projected Returns of Service Parts:

You can compute the return forecast of the service parts based on the return rates and the corresponding product population. The calculations are similar to those of the Product Population based forecasting, except that *returns* history is used instead of the *usage* history, and *return* rates are used instead of *failure* rates.

### User-Specified Return Rates

You enter the average return rates on the Failure Rate window. Once the average return rates and the corresponding product population are known, the returns can be forecast using the following equation:

Return forecast for service part (i,t) =  $\sum_{j=1}^n$  (projected product population (j,t) \* return rate(i,j))

where,

*i* is the Service part being used in Product *j*

*n* is the total number of products using service part(i)

See Setting Up Install Base, Failure, Return, and Retirement Rates, page 5-8.



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## Defining Forecasting Rules

This chapter covers the following topics:

- Overview – Forecasting Rules
- Defining Usage, Shipments, or Returns Based Forecasting Rules
- Population-Based Forecast Rules
- Setting Up Install Base, Failure, Return, and Retirement Rates
- Defining Product Population Based Forecast Rule Parameters
- Dual Output Levels
- Defining Forecast Rule Horizon Details
- Available Forecasting Methods
- Setting Forecasting Method Basic Parameters
- Setting Forecasting Method Advanced Parameters
- Checking for Intermittency
- Setting the Intermittent Demand Inventory Item Attribute
- Associating Forecasting Rules with Items
- Setting Up Lifetime Buy Functionality

### Overview – Forecasting Rules

You specify forecast rules to determine the history source and the forecast methods to use when generating the spare part forecasts. All parts in the scope of the plan associated with the appropriate forecast rule are forecast.

You specify the forecast method and the data stream basis of forecast calculations in the Forecast Rules window. This form consists of a header region and three tabs:

- Usage / Shipment / Return Forecast

- Product Population Forecast
- Horizon Details

This chapter explains how to:

1. Define usage, shipment, or returns-based forecasting rules, page 5-2.
  - Assign the forecast method and other parameters.
  - Define the basis for calculating the forecast.
2. Define population-based forecasting rules, page 5-6.
  - Define install base population, failure rate, and retirement rate parameters.
  - Assign the forecast method and other parameters.
  - Define the basis for calculating the forecast.

**Note:** It is possible to set up both usage based and population based forecasts for the same item. See Dual Output Levels, page 5-15.

3. Define horizon details, page 5-16.
4. Setting forecasting method basic parameters, page 5-19.
5. Associating forecast rules with items, page 5-23.
  - Assign forecast rules to items
  - Update or change the forecast rule assigned to these items.

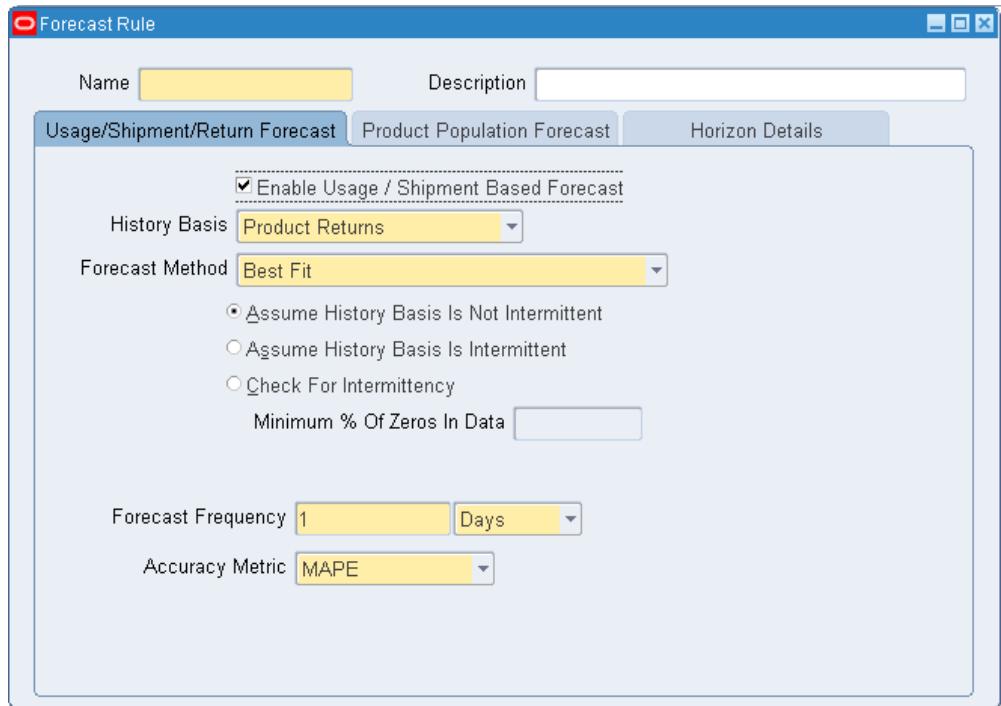
## Defining Usage, Shipments, or Returns Based Forecasting Rules

You use the Forecast Rules window to assign the forecast method and define the basis for calculating the forecast.

### To define usage, shipment, or returns-based forecast rules:

1. From the Service Supply Chain Planner responsibility, navigate to the Forecasting Rules window.  
Setup > Forecast Rules Forecasting Rules – Usage / Shipment / Return Forecast tab  
The Forecast Rule window appears, with the Usage/Shipment/Return Forecast tab

selected.



2. Define the forecast rule name and description.
3. Select the Usage/Shipment/Return Forecast tab.
4. To enable Usage and Shipment based forecasting, select the Usage/Shipment/Return Forecast check box.
5. Define the forecast rule parameters. For a description of these parameters, see the table that immediately follows this procedure.
  - Select History Basis from the LOV. See Overview - Inline Forecasts, page 4-1.

**Note:** Inline forecasting generates forecasts for an item at either the zone level or the organization level.

- If the history stream is based on field technicians' usage, the forecast is at the *zone* level.
- If the history stream is based on shipment or usage (component issue) at the internal repair depot organization, the forecast is at the *organization* ship from level.

- Select the forecast method from the LOV. See Available Forecasting Methods,

page 5-18.

- Select one of the following radio buttons to indicate whether to use forecasting methods designed for intermittent data history:

- Assume History Basis is Not Intermittent.
- Assume History Basis is Intermittent.
- Check For Intermittency

If you select the Check for Intermittency radio button, the Minimum % Of Zeros in Data field is enabled. Enter the threshold value. See Checking for Intermittency, page 5-23.

- Set the Forecast Frequency.
- Choose one of the following accuracy metrics from the LOV.
  - Mean Absolute Percentage Error (MAPE)
  - Mean Absolute Deviation (MAD)

6. (Optional) Change the Forecast Method parameter default values. See Setting Forecasting Method Basic Parameters, page 5-19.
7. Click Save.
8. Proceed to Defining the Forecast Rule Horizon Details, page 5-16.

***Forecasting Rules – Usage/Shipment/Return Forecast tab parameters:***

Field	Description	Validation	Default Value
(Header) Name	The Forecast Rule name entered here calls the forecast rule.		
(Header) Description	Optional. You can enter an extended definition for the forecast rule.		
Enable Usage / Shipment Based Forecast	Select the check box to enable forecasts based on Usage and Shipment data streams.		Not Selected

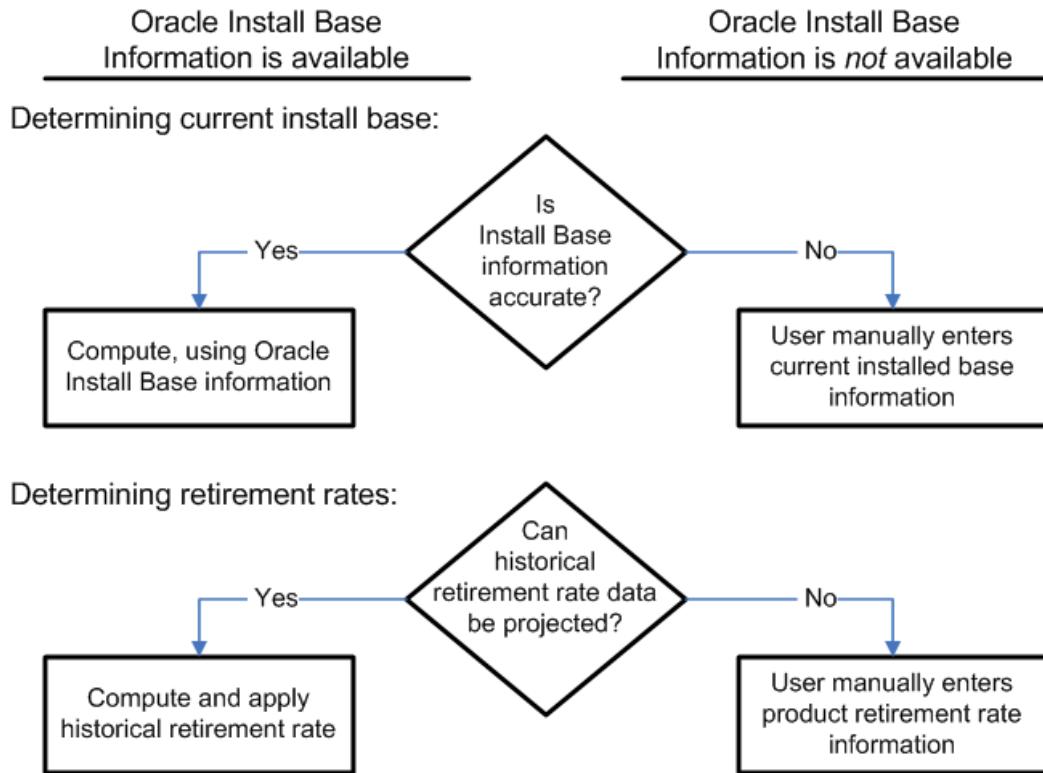
Field	Description	Validation	Default Value
History Basis	This field lists collected data streams of usage and shipment history from returns of products and service parts.	LOV, history data streams	None
Forecast Method	Select a supported forecast method. See Inline Forecasting Overview, page 4-1.	LOV, supported forecast methods	None
Assume History Basis is Not Intermittent	Select this radio button if you know that the data history is not intermittent.		Selected
Assume History Basis is Intermittent	Select this radio button if you know that the data history is intermittent.		Not selected
Check for Intermittency	Select to cause the system to check whether the percentage of zeros in the history data exceeds the threshold value. See the next row in this table, Minimum % Of Zeros in Data.		Not selected
Minimum % Of Zeros In Data	Works with the Check for Intermittency radio button to establish the threshold percentage above which the history data is determined to be intermittent.	Number	Disabled
Forecasting Frequency	Planning records retain the latest forecast date for each item and group combination. Planning regenerates forecasts based on the frequency specified here.	Number and bucket size (days, weeks, or periods)	
Accuracy Metric	Select the calculation method to measure forecast accuracy.	Mean absolute deviation (MAD), or Mean absolute percent of error (MAPE)	MAPE

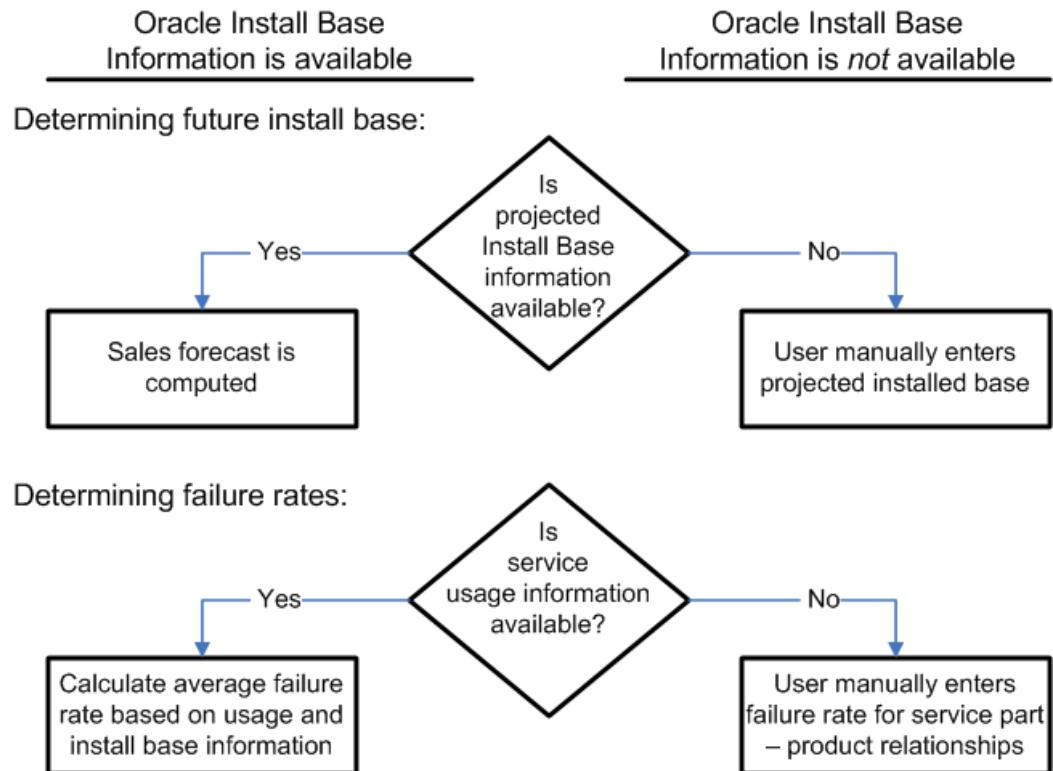
## Population-Based Forecast Rules

This alternative approach to calculating forecasts is often used when history data is insufficient to reliably calculate a forecast.

### Decision Diagrams for Selecting Population-Based Forecast Rule Parameters

When suitable data is available, you can choose to allow the system to calculate factors used in the population based projections. When data is not available, you enter estimates for these values based on your experience. The following flow diagrams illustrate the decision process in selecting elements of population based forecasting:





As seen in the previous diagrams, if information from Oracle Installed Base is not available, you provide the relevant data needed to calculate projected demand. When the relevant data is not provided, the following assumptions are made, and appropriate warning messages are provided in the log file:

	Oracle Installed base available	Oracle Install Base not available
Current installed base	Manual entry (but not provided) – Assume zero	Manual entry (but not provided) – Assume zero
Retirement rate	Manual entry (but not provided) – Assume zero	Manual entry (but not provided) – Assume zero
Projected installed base	Calculated, but sales order history is not available – Assume zero and provide a warning in the log file	Manual entry (but not provided) – Assume zero and provide a warning in the log file
Failure rate	Manual entry (but not provided) – Assume zero and provide a warning	Manual entry (but not provided) – Assume zero and provide a warning

## Product Population Based Forecasting Rule Parameters

This section describes how to manually enter the following Forecast Rule parameters for Product Population based forecasts:

- Failure Rate and Return Rate for the combination of product and service part, as determined by the service item relationship.

Users typically base returns forecasts of newly introduced products on failure rate forecasts. For existing products, you might prefer to employ usage-based or shipment-based forecasts. In such cases, to avoid doubling demand from the failures of existing products, ensure that failure rates and return rates *are not* entered for existing products in the forecasting rule.

- Product retirement rate to decrement the installed base population.
- Current installed base needs to be entered when information from Oracle Install Base is not available.

The entries are global (or organization independent) in nature.

## Setting Up Install Base, Failure, Return, and Retirement Rates

The Failure Rate window, available from the Setup menu, captures the average failure rates, return rates, retirement rates, and currently installed base population information.

- You cannot add any new product and service part relationships in this window. The service item relationship is based on collected information.
- Organization is not part of the find criteria, because this information is independent of organization.

1. From the Service Supply Chain Planner responsibility, navigate to the Failure Rates window.

Setup > Failure Rates

Service Part Name	Description	Failure Rate	Return Rate
BJ-LG-COMP	Component	.0014	.7

2. In the header region, select the product. The scope of the items is limited to items that are parent items in the service relationship.
3. Click Find.

The system populates the Product region of the Failure Rate form according to the find criteria.

**Note:** You can select a new product at the header level, if needed.

#### **To Set the Retirement Rate and the Current Install Base:**

1. You can manually enter the retirement rate for the selected product, in percent per time bucket.
2. You can also manually enter the quantity of the selected product that represents the number of units that are currently installed.

#### **To Set the Failure Rate and the Return Rate:**

1. when you select a product, the Service Part name region is populated with all the relevant service parts with which service relationships are established.

**Note:** Query functionality (F11 and Ctrl F11) is available in the Service Part Name region.

2. Select a service part.

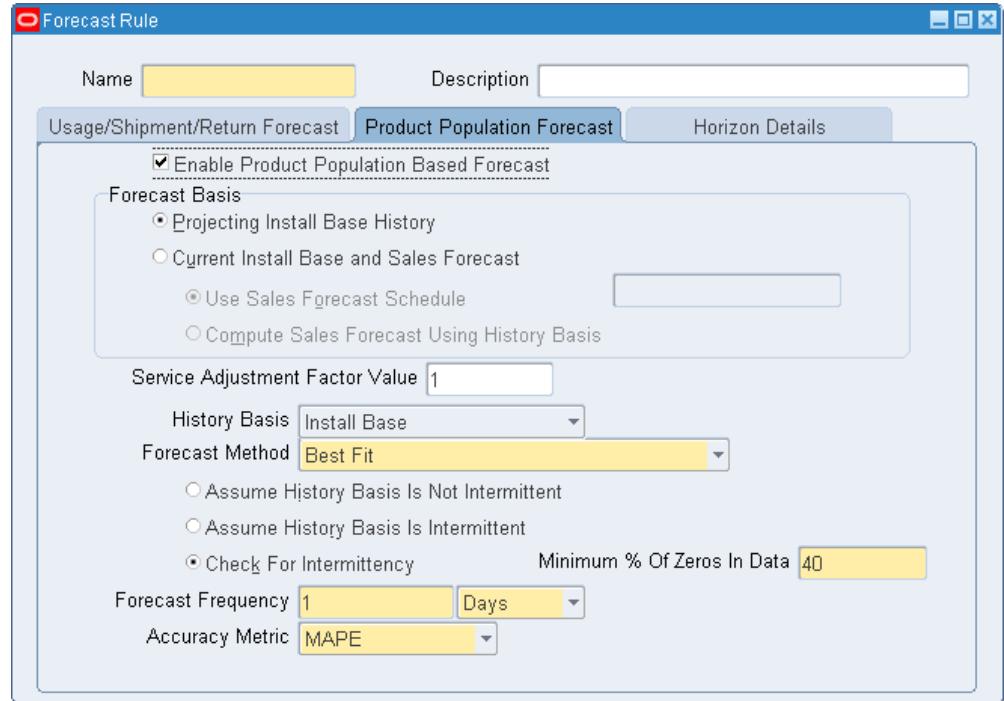
3. Enter the average failure rate and average return rate for the selected service part, in percent per time bucket.
4. Click Save.

## Defining Product Population Based Forecast Rule Parameters

You specify Forecasting Rule parameters for population based forecasting in the Product Population Forecast tab of the Forecasting Rule window. The parameters for non-product population-based forecasts appear under the Usage/Shipment/Return Forecast tab. See Defining Usage Based Forecast Rules, page 5-2.

### **To specify product population-based forecasting rule parameters:**

1. From the Service Supply Chain Planner responsibility, navigate to the Forecast Rule form.  
Setup > Forecast Rules
2. Select the Product Population Forecast tab.



3. Define the forecast rule name and description.
4. Select the Product Population Forecast tab.

#### To Define Forecast Rule Parameters

5. To enable forecasts based on install base population and failure rates, select the Enable Product Population Based Forecast check box.
6. Choose one of the following forecast basis radio buttons.:
  - Projecting Install Base History
  - Current Install Base & Sales Forecast.

If you select the Projecting Install Base History radio button:

- The Use Sales Forecast Schedule and Compute Sales Forecast Using History radio buttons are disabled.
- The History Basis is automatically set to Install Base.

If you select the Current Install Base & Sales Forecast radio button, the following two radio buttons are enabled:

- Use Sales Forecast Schedule (or upload a flat file).

- Compute the Sales Forecast Using History.

If you select Use Sales Forecast Schedule, and you want to upload a flat file, you can then point to a Demand Schedule for the Sales Forecast. Then select the flat file to be uploaded from the network. In the case of a flat file upload, the file is collected and presented as a schedule.

The control file for the flat file loading of sales forecast is as follows:

Item	Quantity	Start Date	End Date	UOM
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**Note:** You must load the data in the same bucket as defined in the Forecasting tab of plan options.

7. If you select the Compute the Sales Forecast Using History radio button, the system computes the sales forecast. In the History Basis field choose either Usage or Shipment from the list of values.
8. (Optional) Specify the Service Adjustment Factor value in the range of zero to one. Because not all product sales necessarily translate into a service contract, you can use this factor to adjust the sales forecast to account for your estimated service market share.
9. Select the forecast method from the LOV. The forecast method applies to either the install base forecast or sales forecast, depending on previous selections. See Available Forecasting Methods, page 5-18.
10. (Optional) Change the forecast method parameter default values. See Setting Forecasting Method Basic Parameters, page 5-19.
11. Select one of the following radio buttons to indicate whether to use forecasting methods designed for intermittent data history:
  - Assume History Basis is Not Intermittent
  - Assume History Basis is Intermittent
  - Check For Intermittency
 If you select the Check for Intermittency radio button, the Minimum % Of Zeros in Data field is enabled. Enter the threshold value. See Checking for Intermittency, page 5-23.
12. Set the forecast frequency.

13. Choose an accuracy metric from the LOV.
  - MAPE
  - MAD
14. Click Save.
15. Proceed to Defining the Forecast Rule Horizon Details, page 5-16

***Forecasting Rules – Product Population Forecast tab Parameters:***

Field	Description	Validation	Default Value
Enable Product Population Based Forecast	Select to enable forecasts based on install base population data and failure rates.		Not Selected
Forecast Basis – Projecting Install Base History	Select to create this forecast by projecting the patterns existing in the Install Base History data (only).	Radio button	
Forecast Basis – Current Install Base & Sales Forecast	Select to create this forecast based on the current Install Base history data and sales forecasts. The sales forecast can either be available as a demand schedule, or can be computed in the system.	Radio button	
Use Sales Forecast Schedule	If the Forecast Basis is Current Install Base & Sales Forecast, select this radio button to use a sales forecast schedule. This radio button enables the LOV for selecting the schedule.	Radio button, LOV	
Compute Sales Forecast Using History	If the Forecast Basis is Current Install Base & Sales Forecast, select this radio button to compute the sales forecast based on history.	Radio button	
Service Adjustment Factor Value *	The estimated proportion of sold products that are contracted for service.	Number, within range zero to one	

Field	Description	Validation	Default Value
History Basis	This field lists collected data streams of usage and shipment history from returns of products and service parts.	LOV, data streams	
Forecast Method	Select a supported forecast method. See Overview - Inline Forecasts, page 4-1.	LOV, supported forecast methods	None
Assume History Basis is Not Intermittent	Select if it is known that the data history is not intermittent.	Radio button	Selected
Assume History Basis is Intermittent	Select if it is known that the data history is intermittent.	Radio button	Not selected
Check for Intermittency	Select to cause the system to check whether the percentage of zeros in the history data exceeds the threshold value. See the next row in this table, Minimum % Of Zeros in Data.		Not selected
Minimum % Of Zeros In Data	Works with the Check for Intermittency radio button to establish the threshold percentage above which the history data is determined to be intermittent.	Number	Disabled
Forecasting Frequency	Planning retains the latest forecast date for each item and group combination. Planning regenerates forecasts based on the frequency specified here.	Number and bucket size (days, weeks, or periods)	
Accuracy Metric	Select the calculation method to measure forecast accuracy.	MAD or MAPE	MAPE

\* The Service Adjustment Factor Value is a number in the range of zero to one. Because not all product sales necessarily translate into a service contract, you can use this factor to adjust the sales forecast to provide an estimate of your service market share.

## Dual Output Levels

For a given item, it is possible to define output level information for both:

- Usage or shipment based forecast
- Product population-based forecast.

This functionality supports the following typical scenario:

You want to use usage-based forecasting for spare parts demand due to established product populations, for which service part usage histories are available, and use failure rate forecasting for new product populations, for which no service part usage histories are available.

If both usage-related and product population-related parameters are defined, and they overlap each other, then the numbers are accumulated to determine the final forecast. Because the levels of output of usage forecasts and product population-based forecast could be different, the accumulation is done at the organization level after distribution of the forecasts.

## Dual Output Level Example

It is possible to set up both usage-based and population-based forecasts for the same item. The example describes a scenario where the correct strategy is to enable the failure rate and return rates for only *newly introduced* products.

- Cartridge x is used in Printer A and Printer B.
- The Cartridge x usage-based forecast (total for Printer A and Printer B) is 100 units per month.
- Printer C is introduced to the market, and uses Cartridge x as well.
- Due to the introduction of Printer C, usage of Cartridge x is expected to increase by 25 per month.
- Service part and product relationships are set up for Cartridge x and all three of the printers (A, B, & C).
- Printers A, B, & C are selected in the Find window to populate the Product region of the Failure Rate form.
- In the Service Part region, the Cartridge x Service enabled for Product check box is selected *for all three printers*.

**Inaccurate Result:** The total forecast for Cartridge x is about 225 per month. This is inaccurate, due to double counting. In this example, 100 cartridges from the

usage-based forecast for Printers A and B, plus about 125 cartridges from the population-based forecast that was set up here accumulate to about 225 cartridges.

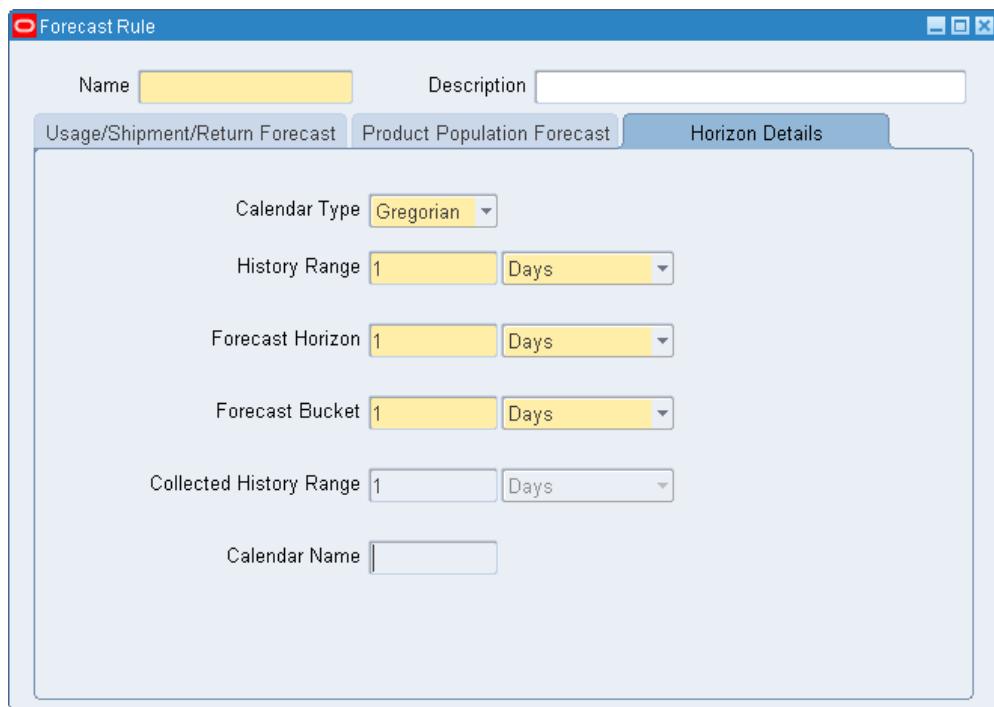
The correct approach is to enable the failure rate and return rate for only the new product (Printer C). To correct this setup, deselect the Service enabled for Product check boxes for Printer A and Printer B.

**Correct Result:** If only Printer C is enabled for failure rate and return rate, then the total forecast for Cartridge x = 100 (usage-based) + 25 (product population-based from Printer C) = 125 per month.

## Defining Forecast Rule Horizon Details

### To define forecast rule horizon details:

1. Select the Horizon Details tab.



2. Select the calendar type from the LOV.
  - Gregorian
  - Manufacturing
3. Complete the parameters. For a description of the parameters, see the table that immediately follows this procedure.

- Click Save.

#### **Forecast Rules - Horizon Details tab Parameters**

Field	Description	Value	UOM	Default Value	Default UOM
Calendar Type	Defines the calendar type to be applied	1 – Gregorian 2 – Manufacturing	NA	2 – Manufacturing	NA
History Range	Historical periods of data to be considered *	Positive integer	Manufacturing: Days, Weeks, Periods	1	Month
Forecast Horizon	Future periods for which forecast is generated	Positive integer	Manufacturing: Days, Weeks, Periods Gregorian: Months, Quarters, Years	1	Month
Forecast Bucket	Size of time bucket for generated forecasts, and as well as the history	Positive integer	Manufacturing: Days, Weeks, Periods Gregorian: Months, Quarters, Years	1	Month
Collected History Range	This noneditable field displays the maximum value for the 'History Range' setting. **				
Calendar Name	When Calendar Type is Manufacturing, this noneditable field displays the Calendar name .				

\* When the user specifies multiple forecast methods for an item, the History Range specified here applies to all methods. Each method, however, can be based on a

different collection stream, for example, usage-based forecasting for parts where usage history is available, and product population-based forecasting where the part usage history is not available.

\*\* The Collected History Range is the *shortest* of all the ranges of the individual streams that are being used.

**Note:** If the Manufacturing calendar is specified, then the forecasting engine uses the calendar specified in the profile Calendar reference for bucketing. In the absence of this profile setting, the forecasting engine uses the Manufacturing calendar for the organization that owns the plan.

## Available Forecasting Methods

The available forecast methods are:

1. Blended
2. Single Exponential Smoothing
3. Double Exponential Smoothing (Holt)
4. Integrated Causal Exponential Smoothing (Modified Winters)
5. Regression with seasonal causal factors
6. Multiplicative Monte Carlo regression with seasonal causal factors
7. Croston for intermittent data
8. Regression with seasonal causal for intermittent data
9. Multiplicative Monte Carlo regression with seasonal causal factors for intermittent data

The Blended forecast is a Bayesian information criterion weighted combination of several methods. For non intermittent data, the engine uses methods 2 through 6. For intermittent data, the engine uses methods 7 through 9.

During SPP setup, each forecasting method is seeded with a set of instance-level default parameter values. To set the default values, see Setting Forecasting Method Advanced Parameters, page 5-22.

## Setting Forecasting Method Basic Parameters

You can use the following procedures to specify forecast parameters for each forecasting method.

### To set basic parameters:

1. From the Service Supply Chain Planner responsibility, navigate to the Forecast Parameters window.

Setup > Advanced Forecasting Parameters

The Forecast Parameters window opens to the Basic tab.

2. In the Parameters region, select one of the following radio buttons:

- Determine Optimal Constants Automatically
- Use Values Below

If you chose Determine Optimal Constants Automatically, you can not set the following parameter values:

- Level Coefficient (Alpha)
- Trend Coefficient (Gamma)

3. If you chose the Use Values Below radio button, you can specify parameter values relevant to the selected forecasting method. The following tables describe the basic forecast parameters for each supported forecast method.

#### *Simple moving average*

Parameter	Default Value	Validation / LOV	Comments
Moving Average Interval	3	Integer, Minimum value = 2	

### ***Simple exponential smoothing***

<b>Parameter</b>	<b>Default Value</b>	<b>Validation / LOV</b>	<b>Comments</b>
Alpha (smoothing constant for demand level)	None	Valid values in the range from 0 to 1.	If this parameter is omitted, the forecast engine computes this smoothing constant value.

### ***Holt, and Croston for intermittent history data***

<b>Parameter</b>	<b>Default Value</b>	<b>Validation / LOV</b>	<b>Comments</b>
Alpha (smoothing constant for demand level)	None	Valid values in the range from 0 to 1.	If this parameter is omitted, the forecast engine computes this smoothing constant value.
Gamma (smoothing constant for trend)	None	Valid values in the range from 0 to 1	If this parameter is omitted, the forecast engine computes this smoothing constant value.

### ***Modified Winters (integrated causal exponential smoothing)***

<b>Parameter</b>	<b>Default Value</b>	<b>Validation / LOV</b>	<b>Comments</b>
Alpha (smoothing constant for demand level)	None	Valid values in the range from 0 to 1.	If this parameter is omitted, the forecast engine computes this smoothing constant value.
Gamma (smoothing constant for trend)	None	Valid values in the range from 0 to 1	If this parameter is omitted, the forecast engine computes this smoothing constant value.
Seasonal Period *	Year	Week, Year	

### Method

- Regression with seasonal causal
- Multiplicative Monte Carlo regression with seasonal causal
- Regression with seasonal causal for intermittent data, and
- Multiplicative Monte Carlo Regression with season causal for intermittent data

Parameter	Default Value	Validation / LOV	Comments
Seasonal Period *	Year	Week, Year	

**Note:** \* Seasonal Periods

- If the forecast uses the Manufacturing calendar, then select week or year.
- If the forecast uses the Gregorian calendar, then select year.
- The selected bucket size value should be at a higher (more aggregate) level than the forecasting bucket size. For example, if the forecast is calculated in monthly buckets using the Gregorian calendar, then the only eligible value for seasonal period is year, which is at a higher level of aggregation than monthly buckets.
- If the seasonal period value is omitted, or an invalid value is specified, then the assumed value is year.

### Blended Parameters

If you know the data is non intermittent, then you can specify parameters for methods:

- 2. Single Exponential Smoothing
- 3. Double Exponential Smoothing (Holt)
- 4. Integrated Causal Exponential Smoothing (Modified Winters)
- 5. Regression with seasonal causal factors
- 6. Multiplicative Monte Carlo regression with seasonal causal factors

If you know the data is intermittent, then you can specify parameters for methods:

- 7. Croston for intermittent data
- 8. Regression with seasonal causal for intermittent data
- 9. Multiplicative Monte Carlo regression with seasonal causal factors for intermittent data

### Preprocessing

The following basic preprocessing controls are available for adjusting the data:

Parameter	Default Value	Validation / LOV
Ignore Leading Zeros	No, if intermittent	Check box
	Yes, if non intermittent	
Fill Missing Values		LOV
		Fill Missing Values with Zeros, Fill Missing Values with Linear Interpolation, Omit
Correct Gross Outliers	Yes (check box selected)	Check box

## Setting Forecasting Method Advanced Parameters

Setting the Advanced Parameters provides fine control of the forecasting process.

### To set advanced parameters:

1. From the Service Supply Chain Planner responsibility, navigate to the Forecast Parameters window.

Setup > Advanced Forecasting Parameters

The Forecast Parameters window opens to the Basic tab.

2. Select the Advanced tab.

The Advanced tab opens to the General sub tab.

For more information about the meaning and impact of these advanced parameters, see the *Oracle Demantra Demand Management User Guide*.

## Checking for Intermittency

The forecasting engine performs a check for intermittency by checking the percentage of zeros or null values occurring in the data series. If the percentage of zeros is above the user-specified threshold value, then the data is assumed to be intermittent.

The intermittency threshold default value is 40%. The input history data series is also assumed to be intermittent when the user selects the Blended Forecast method and the Inventory Item Attribute Intermittent\_Demand appearing on the MPS/MRP tab is set to Yes. See [Setting the Intermittent Demand Inventory Item Attribute, page 5-23](#).

If the Blended forecasting method is selected, and if the data is intermittent, then the forecasting methods designed for intermittent data are used in the calculations for the Blended forecast.

## Setting the Intermittent Demand Inventory Item Attribute

The history data series is assumed to be intermittent when the user chooses the Blended forecast method and the inventory item attribute Intermittent Demand, is set to Yes. If the Blended forecasting method is selected, and if the data is intermittent, then the forecasting methods designed for intermittent data is used in the calculations for the Blended forecast.

See

- [Item Simulation Set, page 8-15](#).
- [Creating Item Simulation Sets, page 8-15](#)

## Associating Forecasting Rules with Items

You can use the Item Simulation Set (Mass Maintenance) to associate forecast rules to item and organization combinations.

### To associate forecasting rules with items:

1. From the Service Supply Chain planner responsibility, navigate to Item Attributes Mass Maintenance window.  
Setup > Item Attributes Mass Maintenance.
2. In the header region, enter the Item Simulation Set Name. In the Scope region select the Organization radio button. In the Find Items region, select the All radio button.
3. Click Find.

The Find Items window appears.

4. Specify criteria to retrieve the item-organization combinations for which you want to set these item attributes.

5. Click Find.

The Find Item window closes. The system populates the Item Attribute Mass Maintenance window with Item and organization combinations matching the Find criteria.

6. Select one or more items.

7. In Item attributes available for update region, perform a query to retrieve the desired attributes.

The Item-Org Details region lists all item attributes collected for the selected items and organization combinations, and includes certain destination-only fields.

8. Update the following attributes:

- Forecast Rule for Demand
- Forecast Rule for Returns

9. Click Apply.

#### ***Destination-only Item and Organization Attributes***

<b>Attribute Name</b>	<b>Description</b>	<b>Validation</b>	<b>Default value</b>
Forecast Rule for Demand	Assigned to an item, this rule controls the methods and data streams used to calculate the demand forecast.	LOV predefined forecast rules	
Forecast Rule for Returns	Assigned to an item, this rule controls the methods and data streams used to calculate the forecast of returned defectives.	LOV predefined forecast rules	

See

- Item Simulation Set (Mass Maintenance), page 8-15.
- Creating Item Simulation Sets, page 8-15

## Setting Up Lifetime Buy Functionality

To ensure that adequate supplies exist for the remaining serviceable life when a product becomes obsolete, first, calculate the remaining serviceable life (or horizon) of the part. Then estimate the Average Demand Beyond the Horizon and the Average Returns Beyond the Horizon.

SPP uses these item attribute values, along with the Life Time Buy Date and End of Life Date to calculate the total requirement to service the product.

The calculation equation follows:

Requirement = (Total estimated demand occurring between the Life Time Buy Date and the Planning Horizon end) + [(Average Demand Beyond Horizon – Average Returns Beyond Horizon) \* (End of Life Date – Horizon End)]

SPP then raises a requisition on the Life Time Buy Date for the net requirement (net of available parts).

### To set up lifetime buy :

1. From the Service Supply Chain planner responsibility, navigate to the Item Attributes Mass Maintenance window.  
Setup > Item Attributes Mass Maintenance
2. In the header region, enter the Item Simulation Set Name. In the Scope region select the Organization radio button. In the Find Items region, select the All radio button.
3. Click Find.

The Find Items window appears.

4. Specify criteria to retrieve the item-organization combinations for which you want to set these item attributes, and then click Find.

The Find Item window closes. The system populates the Item Attribute Mass Maintenance window with Item and organization combinations matching the Find criteria.

5. Select one or more items.

6. In Item attributes available for update region, perform a query to retrieve the desired attributes.

The Item-Org Details region lists all item attributes collected for the selected items and organization combinations, and includes certain destination-only fields.

7. Update the following attributes

- Life Time Buy Date
- End Of Life Date
- Average Demand Beyond Planning Horizon
- Average Returns Beyond Planning Horizon

8. Click Apply.

***Destination-only Item and Organization Attributes***

<b>Attribute Name</b>	<b>Description</b>	<b>Validation</b>	<b>Default value</b>
Life Time Buy Date	The requisition date for the life time buy.	Date	
End Of Life Date	The date beyond which the spare part is considered to be obsolete.	Date > Life time buy date	
Average Demand Beyond Planning Horizon	The average demand rate expected to occur beyond the planning horizon.	Number	
Average Returns Beyond Planning Horizon	The average rate of defective returns supply expected to occur beyond the planning horizon.	Number	

See

- Item Simulation Set (Mass Maintenance), page 8-15.
- Creating Item Simulation Sets, page 8-15

# 6

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## Service Planning Concepts

This chapter covers the following topics:

- Returns Forecast as a Supply Schedule
- Returns Forecast Relief – Returns Forecast Time Fence
- Lead Times for Repair Planning
- Planning Based on Part Condition
- Supersession Item Relationships
- Supersession Part Search Logic
- Generating Planned Orders in Supersession Chain
- Impacts of Supersession Item Relationships on Population-Based Forecasts
- Inventory Balancing – Circular Sourcing
- Demand Priority
- Reverse Logistics Assignment Sets
- Assigning Sourcing Rule – Return to
- Assigning Sourcing Rule – Repair at
- Sourcing Rules and Ranking
- Sourcing Rules and Supersession Item Attributes
- Alternate Shipping Methods
- Valid Constraints
- Cost-Based Optimization
- Enabling Cost Optimization
- Support for Reservation
- Order Modifiers and the Reverse Supply Chain
- Setting Up Refurbished Part as a New Part Number

## Returns Forecast as a Supply Schedule

The forecast for repairable returns is considered as a supply stream in planning. To do this, include the returns forecast in the Plan Options under the supply schedule. When the return forecast is defined for a plan, planning creates an order type called *Returns*. If the supply schedule type is Forecast, then the supply is considered as a Returns supply type in the Planner's Workbench. Planning appropriately offsets this supply to include repair and transfer lead times and generates repair recommendations.

## Hub and Spoke Planning

SPP supports supply schedule functionality where an Advanced Supply Chain Planning (ASCP) plan or a Master Production Schedule (MPS) can be fed as a supply schedule to an SPP plan. The SPP plan is not available as a demand schedule entry to an ASCP plan.

## Returns Forecast Relief – Returns Forecast Time Fence

Both the returns forecast and actual returns are considered as sources of defective item supply. As returns occur, if you do not relieve (or consume) the returns forecast, then the supply of defective parts for repair is likely to be overstated.

### Forecast consumption

For example, the returns forecast projects 100 defectives to be returned each month. With eight days remaining in the current month, you have received 87 defectives. You do not really expect the total supply of defectives for this month to be the total of forecast plus actual returns ( $100 + 87 = 187$ ). A more probable outcome is that by the end of this month, a total of 100 defectives will be received. This includes the 87 that have already been received, and  $(100 - 87 = 13)$  remaining in this month's forecast. At this point, actual receipts have *consumed* most of the forecast.

To continue the example, 18 more defectives are received, and now just two days are remaining in the month. The total of defectives actually received thus far is  $(87 + 18 = 105)$ . At this point, the forecast has been completely consumed. We do not expect any more defectives to be returned during the remaining days of this month.

### Returns Forecast Time Fence

An easier, but less accurate, method to avoid double counting the supply of actual and forecast returns is to implement time fence functionality. A time fence marks a date in the future. The time between the present and the time fence is considered to be within the time fence. The time fence rolls forward as time passes; thus the number of days spanned between the current date and the time fence date remains constant.

Time fence functionality is commonly used in manufacturing operations to freeze the

schedule, thus avoiding disruptive last-minute work schedule changes. As applied here, for the time period within the time fence, the returns forecast is reduced to zero. This avoids double counting the supply from both actual returns and forecast returns during the immediate future periods within the time fence. This time fence is called the *Returns Forecast Time Fence*.

The default value for the Returns Forecast Time Fence is zero. This means that all past-due return forecast quantities (not including the plan run date) are dropped and assumed to be realized in terms of the existing on-hand inventory at the organization.

To accurately retain the remaining portion of the forecast for a large bucket, the forecast in the bucket in which the Return Forecast Time Fence falls is spread evenly across the working days, and only the valid forecast beyond the time fence is retained for the remaining days in the bucket. This is a valid scenario as long as the forecast bucket size is greater than one day.

'Destination-only' Item Attribute Name	Description	Validation	Default value
Returns Forecast Time fence (days)	Time period during which the returns forecast is reduced to zero.	Number	0 => Past due forecast will be dropped

All past-due Returns supply and the supply within the time fence are automatically dropped at the time of planning to offset realization of actual returns into inventory. When planning drops the Returns supply, it spreads the forecast (supply), and retains only the remaining portion of the supply that is valid for the planning bucket. This is a valid requirement if the return forecast is bucketed into weeks or periods.

For example, if the forecast is 70 units per week, and the plan is run on day 1 of the weekly bucket start date, and the attribute value for Return Forecast Time Fence (days) is zero, the engine will retain all the 70 units forecast. If the plan is run on day 5, then the engine retains only 30 units of the original forecast. The table below represents the relief functionality.

Plan run on	Demand date	Original forecast quantity	Current forecast quantity
Day 1	Day 7	70	70
Day 5	Day 7	70	30
Day 7	Day 7	70	10

**Note:** For details on maintaining item attributes for planning see [Associating Forecast Rules with Items](#), page 5-23.

## Forecast Consumption and Sales Orders

Both internal and external sales orders consume their respective forecasts. The demand from the field is generated on the replenishing organization as an Internal Sales Order (ISO). The forecasts for these items are fed to the replenishing organization through local or global forecasts.

When a global forecast is defined as a demand, Supply Chain Planning distributes the demand according to the sourcing rules. See [Sourcing Rules and Ranking](#), page 6-28.

ISOs raised in the replenishing organization (against an internal requisition from the field) consumes forecast at the replenishing organization. The ISO is named *Outbound Shipment – Field Organization*.

The logical sequence for forecast and forecast consumption for service supply chain in case of global forecasting techniques is:

1. Generate the global forecast.
2. Use global sourcing rules to apportion the forecast appropriately.
3. Perform forecast consumption at the replenishing organizations with ISO's (outbound shipments) at the replenishing organization. In the case that local, zone level, and global forecasts all coexist at a replenishing organization, the local forecast is consumed first, before the zonal, and global forecasts, respectively.

The field organizations in the service parts plan are only for the process of generating demand forecasts. These field organizations are not considered for supply planning. Only internal requisitions and internal sales orders (for outbound shipments) received from field organizations are considered as demand. There are no other demands placed from field organizations.

## Lead Times for Repair Planning

The manufacturing organization calendar is used for offsetting repair lead times. Preprocessing and post processing item lead times are not considered in the repair organization.

The item-organization attribute Repair lead time represents the total of the following three lead-time elements:

- Lead time to *transferdefectives* to the repair organization

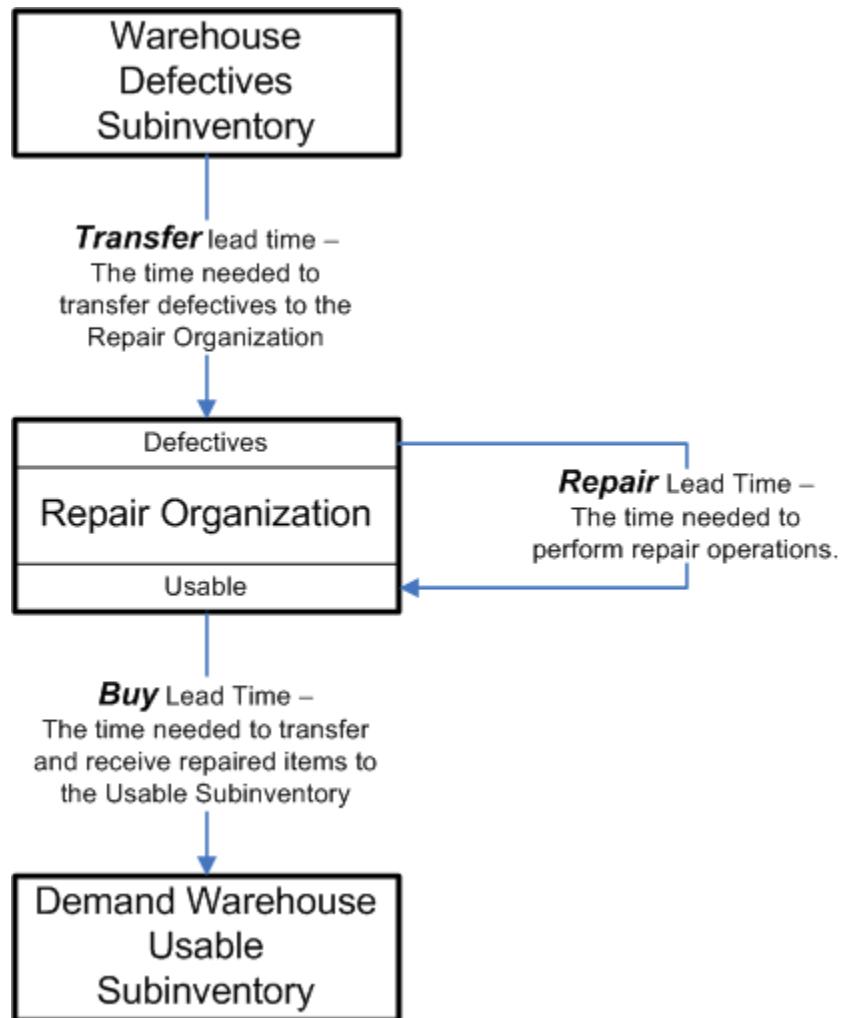
Planning uses the transfer sourcing rule and the relevant shipping network to determine the lead time to transfer defectives to the repair organization.

- Lead time to *repair* a defective part at the repair organization

You define this lead time element for the item and organization combination to represent the duration of repair operations at the repair organization.

- Lead time to *buy*(transfer and receive) usable parts from the repair organization into your warehouse

This lead time is based on the shipping network. It represents the lead time to transfer the usable parts from the repair organization (whether internal or external) and *receive* them into your warehouse.



## Repair Program Influence on Service Supply Chain Lead Time Offset

The repair program impacts planning considerably, because it affects the lead time to procure parts from the repair supplier. Spares Management supports the following repair programs as set up on the Inventory MPS/MRP Planning tab for a given item and

repair supplier combination.

- Repair Return (Pull)

All three lead-time elements are considered to offset repair purchase orders.

- Repair Return with prepositioning (Push)

Because the defectives are already on-hand at the repair organization, only the repair and the receiving lead-time elements are considered.

- Advanced Exchange without prepositioning

- Advanced exchange on purchase order approval

Only the receiving lead time is considered, but all the ordering documents are generated. In this case, planning considers the transfer lead time and the repair lead time to be zero.

- Advanced exchange on defective receipt

Both the transfer and the receiving lead times are considered. All the order documents are generated. In this case, planning considers the repair lead time to be zero.

- Advanced Exchange with Prepositioning

Repaired items are prepositioned and visible to planning. Only the receiving lead time is considered, but all the relevant documents are generated. In this case, planning considers the transfer lead time and the repair lead time to be zero.

In the cases involving advanced exchange, the execution process manages the defective inventory once it is shipped, and issues the material out of the repair organization inventory account on receipt of the parts from the repair supplier.

For more information about repair programs, see the *Oracle Spares Management User Guide*.

## Planning Based on Part Condition

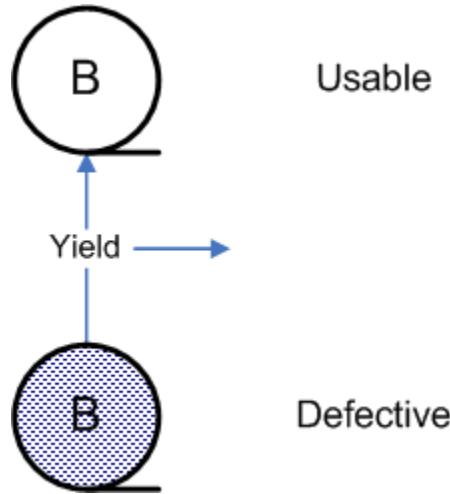
### Part Condition Assumptions for External Repair

The external repair organization has separate subinventories marked for usable and defective parts. Planning will, by default, assume the usable spare part has the *same* part identification as the defective component in the repair bill.

Repair at sourcing looks for the usable part at the repair supplier organization. The bill structure at the repair supplier organization drives the component demand for the defective item. The planning engine looks for the defective part based on the transfer

sourcing rule. Because the on-hand inventory is assumed to be defective, and the Returns order type is also assumed to be defective, planning pulls only defective parts for repair.

The assumed bill of material structure at the repair supplier is:



All defectives shipped for repair to the external repair supplier organization are received into the supplier subinventory that is marked as defective. The repair supplier removes parts from the defectives subinventory according to the repair order, completes the repair, and receives the item into the usable subinventory. When you receive the repaired part at your warehouse, a backflush transaction moves and then deducts the required quantity out of the usable subinventory.

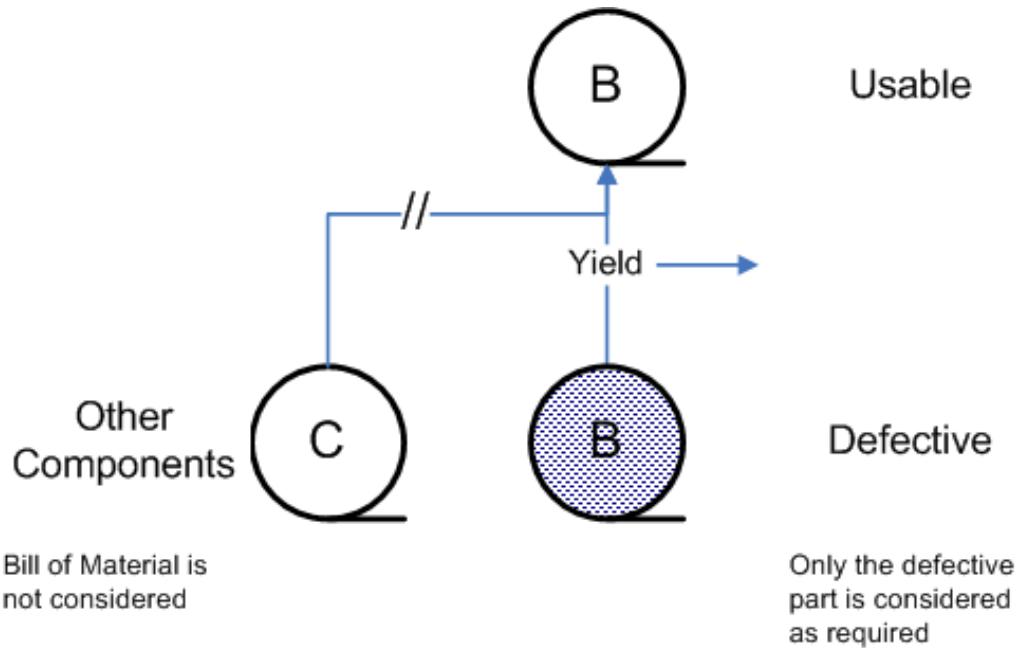
The yield loss is scrapped as a miscellaneous issue out of the defective subinventory at the repair supplier.

## Part Condition Assumptions for Depot Repair

For a depot repair organization, planning assumes that to produce a usable part, a defective part is required.

**Note:** To support the case in which the internal depot repair organization is the same as a manufacturing organization, it is assumed that the service part item numbers are *different* from the component item numbers used in production.

Defective parts are received into the defective subinventory at the depot repair organization. The backflush transaction for the repair order deducts inventory from the defective subinventory.



## Supersession Item Relationships

Supersession items are considered in the service supply chain. Engineering changes in the product generate revised items that are managed based on the supersession definition. Every revision is defined as a new item in the Oracle E-Business Suite. They are grouped together by using the Supersession or Repair to item relationships.

Spares Management uses the inventory item relationship called *Supersession* to capture the supersession chain. Additionally Field Service modules, including Spares Management, use the item relationship called *Repair to* to determine whether a defective part is repairable to its higher revision part.

When generating forecasts or inventory plans, users typically plan the highest revision item while considering the superseded part's demand and supply.

The supersession definition has two parameters related to planning:

- Direction: The direction of the supersession is either unilateral A  $\rightarrow$  B or bilateral C  $\leftarrow \rightarrow$  D. The supersession search direction will first use up superseded parts *when permitted*. For example, in the case of bilateral supersession C  $\leftarrow \rightarrow$  D, it is permitted to use up superseded part C when demand comes in for the higher revision D.
- Disposition Code: The disposition code is either Scrap or Use to Depletion. The default value is Use to Depletion.

In the case in which the disposition code is Scrap, the user manually moves the usable on-hand inventory of the superseded part into a non-netable subinventory.

In the case in which part A can be upgraded to usable part B, the user manually moves the on-hand inventory of part A to the defective subinventory for part B to be pulled or pushed for the upgrade.

In case of Use to Depletion, this is not required. As long as a Repair-to relationship is defined between A and B, the defective A can be repaired to usable B automatically.

Service Parts Planning honors both the supersession direction and the disposition code.

In the forward supply chain, which consists only of usable parts, the supersession definition determines which parts to use up and which replenishment parts to order.

In the reverse supply chain, the Repair to portion of the definition determines the global repair capability for the supersession chain, without the Yield or Repair Lead-time. Currently the supersession definition defines global supersession and repair capability.

For details on the supersession definition and use in Service Parts Planning, refer to the *Oracle Spares Management User Guide*.

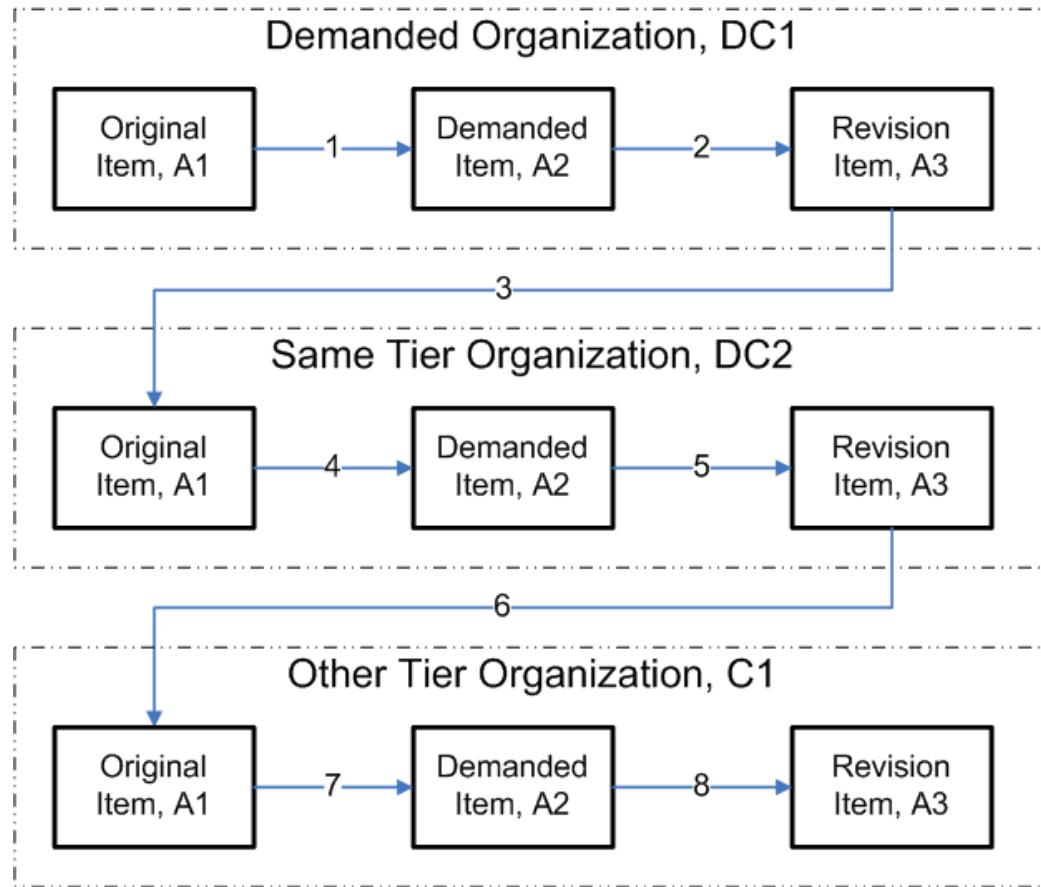
See Defining Item Relationships, page 2-8

## Supersession Part Search Logic

**Location:** The principle that guides search logic is: the demand must be satisfied locally before using the supply from other nodes in the supply chain.

**Revision:** When multiple item revisions have demand occurring on the same day, for the same order type, then the search logic tries to satisfy the demand for a lower revision item prior to moving to demand for a higher revision item. For example, if the supersession chain is A1 -> A2 -> A3, and forecast demand for A1, A2, and A3 exist on the same day, then satisfy demand of A1, then A2, then A3.

The figure illustrates the search logic, in which planning tries to satisfy the demand at the demanded organization by using all the available and valid supersession parts before searching and using the supply from the rest of the supply chain. Say the demand is for Item A2 on Organization C1:



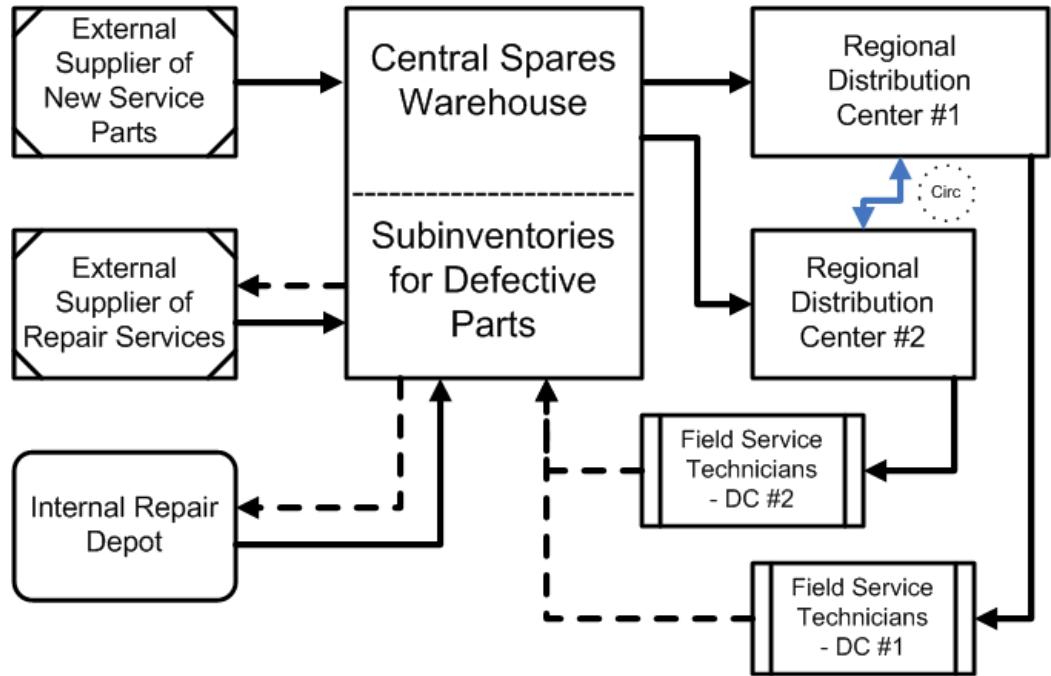
The actual pattern of search within each organization is governed by supersession rules. Consider some of the examples for supersession to understand the meaning of various options for supersession rule definition.

### Unilateral Supersession with Disposition Code Use to Depletion

Item B supersedes item A. Item B is in turn superseded by item C, and then item D. Item D is the latest (highest) revision, with item A being the oldest revision item. The disposition code is Use to Depletion. The planning engine exhausts the on-hand inventory and scheduled receipts of the various revision items using the following supersession rule logic.

A->B<- ->C->D

This notation means that demand of A can be satisfied with B, C, or D. Demand of B, C, or D cannot be satisfied by A. Additionally, B and C can satisfy each other's demand.



Case I: In the supply chain shown in the preceding figure, if the demand occurs for item A at Regional Distribution organization DC1, then planning searches for the on-hand and scheduled receipts items as follows:

1. Item A, then item B, then item C, then item D in DC1
2. Surplus of item A, then item B, then item C, then item D in DC2 (circular source\*)
3. Item A, then item B, then item C, then item D in the central spares warehouse.

\* See Inventory Rebalancing – Circular Sourcing, page 6-15

Case II: If the demand comes for item B at organization DC1, then planning searches for the on-hand and scheduled receipts items as follows:

1. Item B, then item C, then item D, in DC1
2. Surplus of item B, then item C, then item D in DC2 (circular source)
3. Item B, then item C, then item D in central spares warehouse.

Case III:

If the demand comes for item C at organization DC1, then planning searches for the on-hand and scheduled receipts items as follows:

1. Item B, then item C, then item D, in DC1
2. Surplus of item B, then item C, then item D in DC2 (circular source)

3. Item B, then item C, then item D in central spares warehouse.

Case IV:

If the demand comes for item D at organization DC1, then planning searches for the items as follows:

1. Item D, in DC1
2. Surplus of item D in DC2
3. Item D in central spares warehouse.

In Case IV, supersession search does not come into effect because planning determines this to be latest revision, and no bilateral relationship is defined for the part D.

After exhausting the on-hand search, planning determines and uses the Repair to relationship to repair parts, and then uses them as supply prior to raising any new buy orders.

## Unilateral Supersession with Disposition Code Scrap

In this case, the user manually moves the usable on-hand of the superseded part into a non netable subinventory, or if part A can be upgraded to usable B, manually moves to the defective subinventory to be pulled or pushed for the upgrade.

Planning follows the same logic shown in the previous example to search for the parts in the supply chain.

## Bilateral Supersession with Disposition Code Use to Depletion

If an item A has been superseded by an item B which in turn has been superseded by item C and item D with a *bilateral* supersession and a disposition code of Use to Depletion then the planning engine exhausts the on-hand inventory and scheduled receipts based on the following logic.

A<- ->B<- ->C<- ->D

This notation means that all the items are mutually substitutable.

Case I: If the demand comes for item A at organization DC1, then planning searches for the on-hand and scheduled receipts items as follows:

1. Item A, then item B, then item C, then item D, in DC1
2. Surplus of item A, then item B, then item C, then item D in DC2 (circular source)
3. Item A, then item B, then item C, then item D in central spares warehouse.

Case II: If the demand comes for item B at organization DC1, then planning searches for the on-hand inventory and scheduled receipts items as follows:

1. Item A, then item B, then item C, then item D, in DC1
2. Surplus of item A, then item B, then item C, then item D in DC2 (circular source)
3. Item A, then item B, then item C, then item D in central spares warehouse.

Case III: If the demand comes for item C at organization DC1, then planning searches for the on-hand/ scheduled receipts items as follows:

1. Item A, then item B, then item C, then item D, in DC1
2. Surplus of item A, then item B, then item C, then item D in DC2 (circular source)
3. Item A, then item B, then item C, then item D in central spares warehouse.

## Bilateral Supersession and Disposition Code of Scrap

Bilateral supersession and disposition of Scrap is not a valid setup.

**Note:** While searching the supply chain, planning does not honor the disposition of Scrap.

## Generating Planned Orders in Supersession Chain

In field service, repair, and replacement businesses, the emphasis is on locating original item supplies or substitute supplies, and distributing items across a defined distribution channel. The demand for the item can be for any one of the items in the supersession chain. If the supplies are not found in your distribution network, you can purchase needed items, but you cannot buy older revision items (modeled as different items), because the manufacturer probably no longer produces older versions (modeled as a different item) of the item. In such cases, you must buy the most recent revisions (modeled as different item) of the product. This translates to creating new buy supplies only for the highest revision items in the planning engine.

The planned orders for procuring new parts are created after all the existing supplies have been considered. This includes both usable and defectives (after repair) supply.

## Impacts of Supersession Item Relationships on Population-Based Forecasts

Because Install Base tracks the products belonging to a supersession relationship separately, you must take the effects of supersession into consideration.

## Failure Rate Impacts

Product-service part failure rates can be calculated by summing up all the usage history for the entire supersession chain for a specific product, dividing by the total product population for a specific product, and placing the resulting calculated failure rate into product-specific failure rate for the latest revision.

Example supersession relationship:

- Service Part A ->Service Part B (latest revision)
- Service Part A is used in Product X, Product Y
  - Usage for Service Part A – Product X: 5
  - Usage for Service Part A – Product Y: 10
- Service Part B is used in Product X, Product Y
  - Usage for Service Part B – Product X: 7
  - Usage for Service Part B – Product Y: 12
- Total population of Product X: 100
- Total population of Product Y: 125
- Average Failure rate for service part B – Product X:  $(7+5)/100 = .12$
- Average Failure rate for service part B – Product Y:  $(10+12)/125 = .176$

## Collection Impacts

The product Install Base population information is collected along with the usage information. The organization tracked in Install Base is designated as the Install Base organization in the instances setup window so that collections can selectively collect the Install Base information.

The product and service part relationship is collected so that service part to product relationship can be determined. This relationship is not displayed directly, but you can view this product-specific information in the Failure Rates (and Return Rates) window, or the Forecast Analysis View.

You can load legacy Install Base history, failure rates, and return rates

## Interactive planning impacts:

You can edit the failure rates in the Forecast Analysis view. Upon changing the failure

rates or product-specific product population, you can replan and recalculate forecasts based on updated failure rates and return rates. You can also manually override the forecast.

See Sourcing Rules and Supersession Item Attributes, page 6-28.

## Inventory Balancing – Circular Sourcing

To improve customer satisfaction, service supply chains hold inventory at strategic locations, such as regional warehouses. Due to varying demand, rebalancing inventory across warehouse locations may become necessary. The key difference between circular sourcing and normal sourcing is that a circular source participates in the supply chain replenishment only in case of excess (or surplus) inventory that will not be needed within a given time fence.

You make the following considerations while rebalancing inventory:

- Circular sourcing – whether selectively enabled
- Order quantity modifiers – Inventory transfers are not recommended if honoring the order modifier would violate the minimum quantity at the origination.
- Simultaneous reverse transfers – Inventory transfers are not recommended if there is a reverse transfer or native demand occurs within a given time fence.
- Transfer cost – The process should not generate transfer orders when the transfer cost is greater than the inventory carrying cost.

For example, a circular sourcing relationship is set up between two organizations, named East and Central. When a shortage exists in one organization, we want to allow the plan to use the other organization as a supply source.

The circular sourcing relationship means that transfers can be created from East to Central or Central to East. To prevent inventory from continually circling back and forth between the two sites, Service Parts Planning logic does not create transfers in both directions within the same bucket, or across several buckets.

You create a circular sourcing relationship by defining two local sourcing rules for two organizations, and then specifying the circular relationship by selecting the Circular check box. Two example sourcing rules are:

**Receiving Organization R1 (East)**

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	x			Acme	2

**Receiving Organization R2 (Central)**

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	1
Transfer from	R1	x			Acme	2

In the preceding example, the circular relationship is specified between R1 and R2 by selecting Circular on both the R1 local sourcing rule and the R2 local sourcing rule. Both transfer directions must be specified before a valid circular sourcing relationship is established. Ship methods and even in-transit times might apply, although this is not typical.

The following rules apply to specifying a circular sourcing relationship:

- *Local* sourcing rules and bills of distribution can be used to specify a circular sourcing relationship. *Global* sourcing rules cannot be used.
- The two-way circular sourcing relationship must be specified for both directions; otherwise the circular sourcing relationship is not complete.
- A circular sourcing relationships involving three or more organizations must be specified on each local sourcing rule or on the Bill of Distribution (BOD) for each destination organization.

For example, if three organizations, R1, R2 and R3 exist, then the following three local sourcing rules must be set up:

**Receiving Organization R1 (East)**

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	x			Acme	2

**Receiving Organization R2 (Central)**

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	1
Transfer from	R1	x			Acme	2
Transfer from	R3	X			Truck	2

**Receiving Organization R3 (West)**

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	x			Truck	2

In the preceding example, R1 and R2 have a circular sourcing relationship. R2 and R3 also have a circular sourcing relationship. However, no direct relationship exists between R1 and R3. Transfers are not created between organizations R1 and R3.

If the you want to create a complete circular relationship between all three

organizations, then you need to establish each two-way pair at least once in a circular relationship as follows:

***Receiving Organization R1 (East)***

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	x			Acme	2
Transfer from	R3	X			Truck	2

***Receiving Organization R2 (Central)***

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	1
Transfer from	R1	x			Acme	2
Transfer from	R3	X			Truck	2

***Receiving Organization R3 (West)***

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	x			Truck	2

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	R1	X			Truck	2

## Circular Sourcing Rules

Planning logic respects circular sourcing rules. Circular sourcing rules create a use-up-first relationship. In other words, all the excess supplies within the circular relationship are committed first, before additional supplies are sourced from other locations.

Consider the following example:

### *Receiving Organization R1 (East)*

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	2
Transfer from	R2	X			Acme	2

### *Receiving Organization R2 (Central)*

Type	Org	Circular	Allocation %	Rank	Shipping Method	In-transit Time
Transfer from	D2		100	1	Truck	1
Transfer from	R1	X			Acme	2

If demands are either in R1 or R2, the supplies located in the other organization are used up before supplies are sourced from D2. This has the net effect of balancing inventories between R1 and R2.

Circular sourcing logic respects demand priority. That is, if circular sourcing is specified

between Org A and Org B, then transfers are created only when the transfers from Org A to Org B do not take supply that should be allocated to Org A's higher priority demand. The planning engine respects demand priority by considering the surplus projected available balance, and a specified number of days that the surplus must exist before it is considered to fulfill a circular sourcing demand.

*Surplus projected available balance*, or simply, surplus is defined as firm supply, over and above the safety stock inventory level.

See Circular Sourcing Surplus Days, page 6-20.

The following rules are used when circular sourcing relationships are considered:

- A plan option enables or disables circular sourcing for a given plan. The default is to enable circular sourcing.
- Only firm supplies are considered. These are on-hand inventory, firm scheduled receipts, and firm planned orders.
- Only surplus projected available balance is considered as a source of supply for a circular sourcing demand.
- Only the firm supply at the circular source will be used for calculating the excess or surplus. Upstream supply for the circular source is not considered in the calculation.

The Plan Option called Circular Sourcing Surplus Days (default value = 0) specifies the number of days that the surplus must exist before it can be used as a supply for a circular sourcing demand.

Setting the Circular Sourcing Surplus Days to a value that is less than the number of days in the distribution horizon allows surplus to act as a supply to a circular sourcing demand. If demands change dramatically between plan runs, the behavior described in the previous sentence may be desirable. Otherwise, you would set the Circular Sourcing Surplus Days to a value equal to or greater than the distribution planning horizon, to prevent the planning engine from using the surplus (from shipment consolidation) for a circular sourcing demand.

**Example: Circular Sourcing Surplus Days = 3 days.**

Day	1	2	3	4	5	6	7	7	9	10
<b>Demand</b>			3	5					15	
<b>Supply</b>		1		4	7			5		10
<b>PAB</b>	16	17	14	13	20	20	20	25	10	20

Day	1	2	3	4	5	6	7	7	9	10
SS	10	10	10	10	10	10	10	10	10	10
PAB - SS	6	7	4	<u>3</u>	10	10	10	15	<u>0</u>	10
Surplus	<u>3</u>	3	3	3	10	<u>0</u>	0	0	0	

The three units of supply on day 3 are considered surplus. No surplus supply is available on day 6 because of the demand on day 9.

**Note:** The value of the Circular Sourcing Surplus Days is used to add additional days that the surplus should be available. If Circular Sourcing Surplus Days = 0, then the surplus only has to exist at the end of the current day.

- Multiple ship methods are not allowed for circular sources specified on the sourcing rule form. You can specify an organization as a circular source only one time on the sourcing rule. The ship method on the sourcing rule form is used for all transfers in that direction. If ship method is left blank, then the default ship method is used.
- Circular sourcing is considered only in daily planning buckets. It is not considered in the weekly planning buckets. If the user requires circular sourcing for a given number of days in the future, then the number of daily planning buckets in the short term planning horizon must include at least that quantity of days.
- When two circular sourcing demands have the same priority, you cannot control which circular sourcing demand is satisfied first.
- The item order modifiers (fixed lot multiplier) are used for circular sourcing.
  - The planning process will always try to balance inventory or use inventory from the circular source, if possible, before satisfying demand through the normal replenishment process. For example, if the demand can be satisfied by transferring material from the central warehouse, or by balancing inventory within the regional warehouses, planning will choose to balance inventory rather than move more inventory from the central warehouse.
  - Circular sourcing goes hand in hand with supersession. Planning

looks for surplus of the supersession chain, before looking to procure more from other source types (New buy, Transfer from, and Repair at).

## Demand Priority

Service planning follows the same demand prioritization scheme as that used by Oracle Advanced Supply Chain Planning. The Order Details user interface displays the demand priority.

You can specify priorities for allocating scarce supply to each demand type in the source instance, or use SQL tools to load priorities for each demand type into the ODS. If required, you can update demand priority before starting the online plan.

- In the Plan Options form, select the Demand Priority Rule Set: User Defined Priorities. When User Defined Priorities is selected, Service Parts Planning uses the demand priorities you specify for each demand.
- You can enter priorities on sales order lines and on item forecasts. If these fields are null, then no priority is used when allocating supply to a demand.

For more information about demand priorities, see Demand Priority Rules in the Defining Supply Chain Plans chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

## Reverse Logistics Assignment Sets

When deriving the organizations in which planning will look for defectives, you should have a set of sourcing rules such that planning and order promising can easily differentiate between permissible sources for usable and defective items. Repair at and Return to sourcing rules apply exclusively to *defectives*. Similarly, Transfer from and Buy from sourcing rules apply exclusively to *usable* inventory. Thus, depending on part condition, the engine can determine the type of sourcing rule to apply, and deduce the valid source for the item.

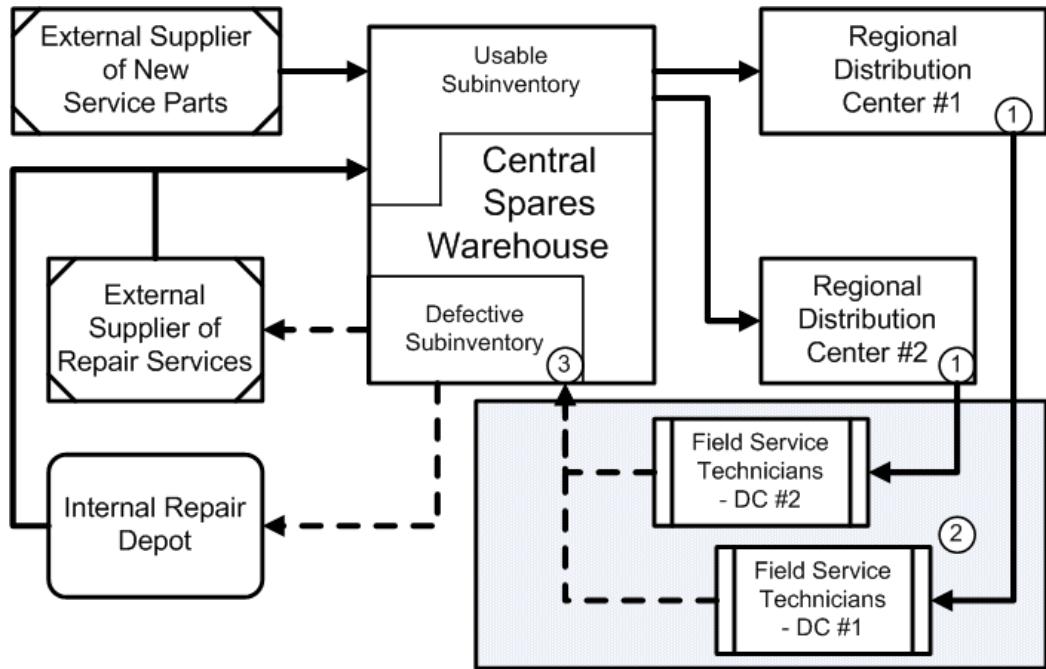
For example, both Transfer from and Return to sourcing rules are defined for the same item. If the defective inventory of the item needs to be transferred, then the valid sources will be determined based on the 'Return to' sourcing rule. Similarly, if the usable inventory of the item needs to be transferred, then the valid sources will be determined using the Transfer from sourcing rule. Essentially, the distinction between defective and usable parts is being made through the sourcing rules.

## Spare Part Forecast Alternatives

- You can choose to generate local returns forecasts, based on the (1) outbound

shipments from the replenishing organizations (see the following diagram). This method of forecasting filters out (3) incoming excess parts returning from the field.

- Generate global forecast for the (2) field service zone, and then use global forecast assignment rules to apportion the forecast appropriately to the replenishing organizations. The global forecast is for both demand and returns.



For spare part demand, the forecast distribution set (in accordance with the global forecasting design), takes the usage forecast from technician organizations and places the demand at the replenishing organizations.

Return forecasts are generated for the field service organization, or the organization where the actual field service return occurs. This forecast is implemented in the returns network appropriately. Because supply chain does not plan for field service organizations, the returns forecast generated for the field service organization needs to be implemented in the organization to which the returned items are transferred. This supply of returns forecast is netted in the supply as Returns.

## Assigning Sourcing Rule – Return to

You assign the Return to sourcing rule to the global forecast assignment set so that it is appropriately considered for pushing down zonal demand to the organization-specific demand.

You can specify organizations only for the Return to sourcing rule, hence a user interface validation has been built into the LOV. Return to sourcing rules for Rank 1 are used. Any sourcing splits within Rank 1 will be honored. Rank 2 and higher can not be

selected.

The Return to sourcing rule is also used to transfer the defectives all the way to the repair organization. Thus, Return to is not used only in the global context, but also in the context of transferring defectives from organization to organization. Therefore, both the All Org (global) level and the Org (local) level sourcing rules are supported with the Return to sourcing type.

This is a destination-instance only form, and can be assigned to the assignment set.

Field	Description	Validation
Type	Determines the sourcing type: Buy, Transfer from, and Make at.	LOV  If choosing the Return To sourcing rule, then also specify the organization. If the organization is a repair supplier organization, the supplier and supplier site attached to this organization appears. You cannot directly enter the supplier and supplier site.

For example, the item A global returns forecast, as generated by demand planning for Zone 1, is quantity 100 units on 10-January and 200 units on 12-January.

Item	Zone	Quantity	Date

---

A	Zone 1	100	10-Jan
A	Zone 1	200	12-Jan

---

The global sourcing rule Return to defines that the preceding global forecast is equally apportioned to the organizations M1 and M2.

---

Org/Supplier	Type	Rank	Percentage	Lead Time
M1	Return to	1	60	2 days
M2	Return to	1	40	3 days

---

If this sourcing rule is assigned to Zone 1, then the order type Returns will be generated in planning by honoring the sourcing rule and equally distributing the returns forecast to the two organizations M1 and M2.

---

Item	Organization	Quantity	Date
A	M1	60	8-Jan
A	M2	40	7-Jan
A	M1	120	10-Jan
A	M2	80	9-Jan

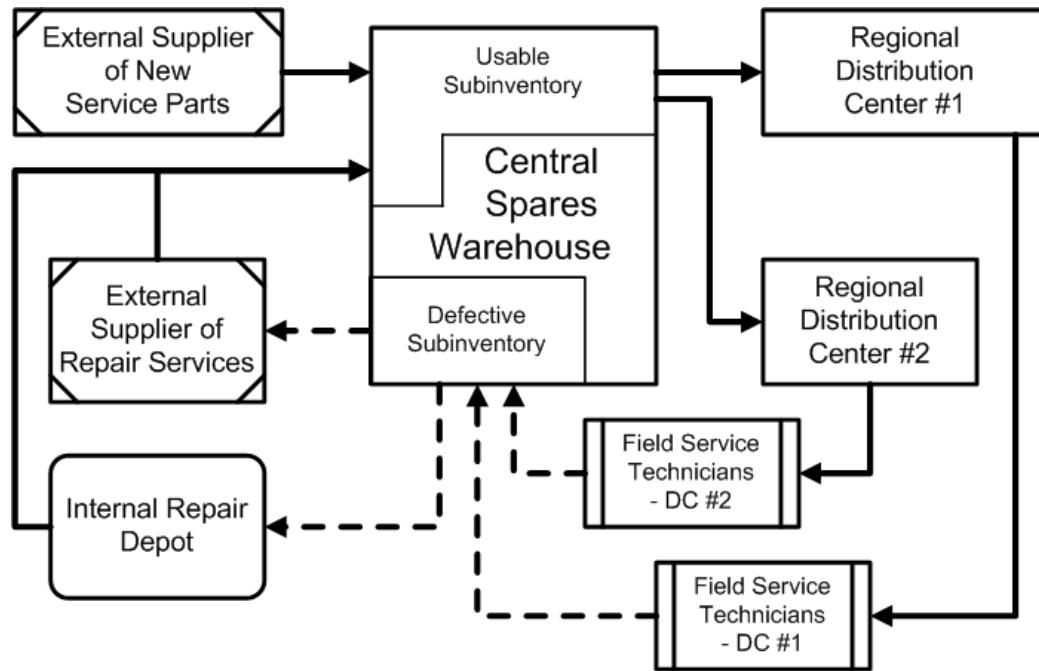
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## Assigning Sourcing Rule – Repair at

The sourcing rule Repair at designates the supplier or organization as a repair organization for that part. The Repair at sourcing rule is valid for both internal and external repair. It is defined in the destination instance, because sourcing is enabled only in the APS destination instance.

Repair at sourcing is defined for the repair organization. Transfer sourcing rules are used to move defectives into the repair organization, and move usable material out of the repair organization. This is valid for both internal and external repair organizations.

For example, consider the following service supply chain:



The Central spares warehouse has Repair at sourcing for both the external repair and the internal repair depot. The sourcing rule is defined as shown in the following table:

Type	Organization/ Supplier	Rank	%
Transfer from	Repair Supplier	Rank 1	100%
Transfer from	Internal Repair Depot	Rank 2	100%
Buy from	New Buy Supplier	Rank 4	100%

Additionally, at the internal and external repair organizations the following sourcing rule is defined:

Type	Organization/ Supplier	Rank	%
Repair at	Repair Supplier	Rank 1	100%

The transfer rule to move defectives will be defined and assigned to the assignment set to move defectives from the central warehouse.

Type	Organization/ Supplier	Rank	%
Return to	Central warehouse	Rank 1	100%

If defectives are being returned to the Central Warehouse, then you also need Transfer from sourcing rules to move the defectives to the repair organizations. These Sourcing Rules have Condition set as Defective in the assignment set.

This sourcing rule can then be assigned to the central spares warehouse and the repair organizations at the appropriate assignment level. This results in appropriate recommendations generated by the planning engine. These include:

- For a repair supplier with the Push or Preposition scenario:
  - Purchase order for the repair supplier
- For the repair supplier with the Pull or Repair-Return scenario:
  - Purchase order for the repair supplier
  - Move order/Internal sales order to move material to the repair supplier
- For the repair depot:
  - Transfer order to move material to the repair depot called as internal repair order
  - Repair work order at the repair depot
  - Transfer order from the repair depot to the demanding organization

Repair at sourcing is analogous to the Make at sourcing rule in terms of definition and validation in the Sourcing Rule/BOD form.

If the organization is a repair supplier organization, the supplier/supplier site attached to this organization appears. You cannot directly enter the supplier/supplier site.

## Repair at versus Make at Sourcing Rules

Repair at sourcing applies only in a service supply chain plan. Service supply chain plans do not use Make at sourcing, and disregard Make at sourcing rule entries from sourcing rules assigned to a service plan. Similarly ASCP and DRP plans disregard the Repair at sourcing rule.

## Sourcing Rules and Ranking

In the service supply chain, the planning preference for satisfying a given demand is:

Service Parts Planning preference	Associated SPP Sourcing Type
1. Use up existing on-hand inventory and scheduled receipts	
2. Balance inventory	Circular sourcing (Transfer from)
3. Transfer from other organizations	Transfer from
4. Repair	Repair at
5. Buy new parts from suppliers	Buy from

For a given item, Service Parts Planning first attempts to meet demand by searching the on-hand inventory and scheduled receipts across the supply chain, and then by using the repair and buy sourcing rules (based on ranking). If more than one source is within a given source type, planning uses the distance from the demanded node, and then resorts to ranking to break the tie.

For example, two Repair at sources exist for organization M1. Service Parts Planning uses the higher ranked source to Repair at prior to using the lower ranked source.

As a second example, assume that two central warehouses exist, one located in Europe and the other in the USA. Both have Repair at sources. If the demand occurs at USA, then planning first uses the Repair at source at USA before using the Repair at source at Europe.

## Sourcing Rules and Supersession Item Attributes

With so many items, and the ability to change the item attributes for individual items, it is important to understand which item's definition will be used in the supply chain plan.

The planning engine considers item-level sourcing rule values. You do not necessarily need to redefine the sourcing rule every time a new item is introduced into the supersession chain. You can set up only one sourcing rule for the entire supersession chain. If one of the items in a chain has a different sourcing rule, then as an exception, set up an item-level sourcing rule. Specific sourcing rules override general sourcing rules.

The behavior or search pattern of the engine when the sourcing rule varies by item is

explained in the following example:

- A -> B (item B supersedes item A)
- A can be sourced from Org 1 (primary) and Org 2 (secondary)
- B can be sourced from Org 2 (primary) and Org 3 (secondary)

In this example, the engine will search for the usable inventory in the following sequence:

1. A in Org 1
2. B in Org 2
3. A in Org 2
4. B in Org 3

The search across the primary sources in the supersession chain occurs first. Next, search across the supersession chain is done for secondary sources.

Similarly, the planning engine considers item-specific attributes. Thus, depending on which item in the supersession chain is being repaired, transferred, or bought, specific attributes of that item are taken into account.

**Note:** New-buy orders can be raised only for the latest revision. Hence new buy-related item attributes are always applicable from the highest revision perspective.

## Alternate Shipping Methods

You can specify the use of alternate shipping methods by defining sourcing rules with alternate shipping methods, and then specifying ranks for them. With alternate sources enabled, a lower-ranked alternate source with an alternate shipping method is considered, if planning determines that using the alternate source would meet demand on time, or as close to the demand date as possible.

**Note:** Because Service Parts Planning has inherent sourcing logic and ranking to first use existing supply, then repair, and then new buy, the alternate ship methods comes into play when considering a supply from a particular source (current supply, repair, or new buy).

For example, existing supply can be transferred from Org1 to Org2 using either the Ground shipping method in 15 days or the Air shipping method in 2 days. Due to lower cost, the preferred method is to ship parts by Ground. You define two sourcing rule entries for Org 1 to Org 2 transfer and specify the two shipping methods in each line.

Planning will try to move parts using the Ground 15 day lead time, but would recommend Air shipping method in case of expedited orders.

## Valid Constraints

Service Parts Planning considers the following constraints:

- Item lead-time constraints: This constraint considers the following lead-time elements:
  - Transfer defectives to the repair organization
  - Repair operations
  - Transfer and receive usable parts to your warehouse
- Material constraints: The quantity of defective parts in the supply chain (considering returns and repair yield) act as a constraint for repair.
- Supplier capacity for repair: The SPP plan is not constrained by the external suppliers' capacity for performing repair work. However, SPP reads these capacities and raises exception messages when the work load exceeds capacity.
- Supplier capacity for new buy: The capacity of a new-buy supplier can be defined through the Planning tab in the approved supplier list (ASL). However SPP does not directly respect the new buy supplier capacity; it can violate this capacity when the supply capacity is insufficient. SPP will, however, generate exception messages to flag violations of supplier capacity constraints.

## Enable or Disable Constraints

Service Parts Planning plan options provide the ability to enable or disable constraints, which include both lead-time and capacity type constraints. Even when constraints are enabled, planning may violate these constraints and issue exception messages accordingly.

## Enforce Capacity Constraints Disabled

Planning tries to honor the lead-time and capacity constraints to meet the demand on time. When capacity is insufficient, planning compresses the lead time or overloads capacity as needed to meet the demand on time.

Lead-time compression logic is as follows:

- Supply Chain Optimization selects a supply chain path that results in the least compression.

- Within the supply chain path, compression occurs closest to the system date. Ties are resolved in the following order:
  1. Repair source
  2. Inventory rebalancing sources
  3. New buy sources

## Enforce Capacity Constraints Enabled

Planning enforces the lead-time and capacity constraints, and tries to satisfy demand by the due dates. If planning cannot meet a demand by the due date, it moves the supply date forward to future buckets until the demand can be satisfied.

- For sales orders and Outbound Shipments – Field Organizations:
  - If the demand type is sales order demand, planning tries to satisfy the demand by the demand due date.
  - If that is not possible, planning tries to satisfy demand at the earliest date possible *after* the due date.
  - If planning cannot satisfy the demand at all, it is assumed to be satisfied on the plan end date (end of the planning horizon).

The Latest Acceptable Date is a display-only column. The engine issues a Late Replenishment exception message with an attribute on the exception called Days Late Beyond the Latest Acceptable Date.

- For forecasts:
  - The profile option MSO: Maximum Allowable Days Late before Forecast Expiration causes forecasts to expire.
  - Planning tries to satisfy any unexpired demand by the demand date, or the earliest day thereafter. In the worst case, demand is assumed to be satisfied at the end of the planning horizon.

Planning uses the bucket end date as the date by which the demand needs to be satisfied.

## Cost-Based Optimization

Service Parts Planning supports a cost-based optimization planning mode. This mode selects supply according to the most cost-effective alternative.

When optimization is enabled, planning does not follow the typical planning source

selection logic (scheduled receipts, then repair, then new buy), but instead chooses the most cost-effective solution. Accurately setting up cost factors, and managing them well, are very important. Inaccurate costs often lead to sub-optimal solutions.

For details on using Item Attributes Mass Maintenance and the Plan Options tab for optimization refer to:

- Item Simulation Sets (Mass Maintenance), page 8-15
- Service Supply Chain Plan Options, page 8-2
- Optimization Tab, page 8-13

## Enabling Cost Optimization

### To enable cost optimization:

1. Set up the repair cost using the Item Attribute Mass Maintenance window, or use the global profile option MSC: Repair cost as a percentage of standard cost.
2. Select the Optimization check box in the Optimization tab of the Plan Options form.
3. (Optional) Adjust the On-time delivery, Profit, and Inventory turns objective weights.

Example a):

- Demand at the central warehouse occurs outside of all the lead times.
- Transfer cost to move defectives from the defective warehouse to the repair facility: 5/unit
- Repair cost: 10/unit
- Transfer cost to move usable parts to the central warehouse: 2/unit
- Purchasing cost: 15/unit

In this case, demand is met using the new-buy supplier because the purchase price for a new unit (15) is less than the total cost to transport and repair a defective unit (17).

Example b):

This scenario has the same costs as in the previous example, but the demand occurs outside of the repair lead time, and inside of the Purchasing lead time. The penalty for late supply is 5/day. That is, the new-buy supplier can not deliver in time to meet the due date.

In this case, demand is met by using the repair facility. The cost (17) is less than the

cost of new-buy plus late penalty. (15 + 5 = 20).

## Support for Reservation

A multilevel reservation model for repair orders maintains links to internal and external repair orders.

### Internal Repair

Customer returns: This repair program calls for the same (serial number) product that was sent for repair to be returned to the customer. In the repair organization, Depot Repair creates a reservation entry for the sales order against the work order. Planning retains and pegs the sales order to the work order.

### External Repair

Purchase orders for repair are tied to transfer orders (to move defectives to the repair organization and move usable parts to your central warehouse) as well as tied to repair work orders at the repair organization.

## Order Modifiers and the Reverse Supply Chain

SPP respects order modifiers for planned new buy orders only. The order modifier for the new buy is supported at the ASL level as well as the item level. In SPP, typically an item will have new buy as well as Repair as type of sourcing. In such case, if the order modifier is set at the item level, it will be respected for new-buy planned orders only, and not for repair planned orders.

A post-process (occurring after the Supply Chain Optimization solver) adjusts new buy recommendations according to the item's order modifier quantity, and then eliminates other new-buy recommendations that are made unnecessary as a result of the order quantity adjustment. This is a material buffer correction at the level of the new buy item only. No correction is made at any other level or item.

Thus adjustment is done such that new buys of the future buckets are adjusted first before adjusting the repair supplies. You see supplier capacity and exceptions pointing to violations of supplier capacity.

The SPP engine does not consider supplier capacity constraints. This means that SPP will not recommend off loading from a primary new-buy supplier to an alternate new buy supplier *because of capacity*. It is capable of doing so for lead-time reasons.

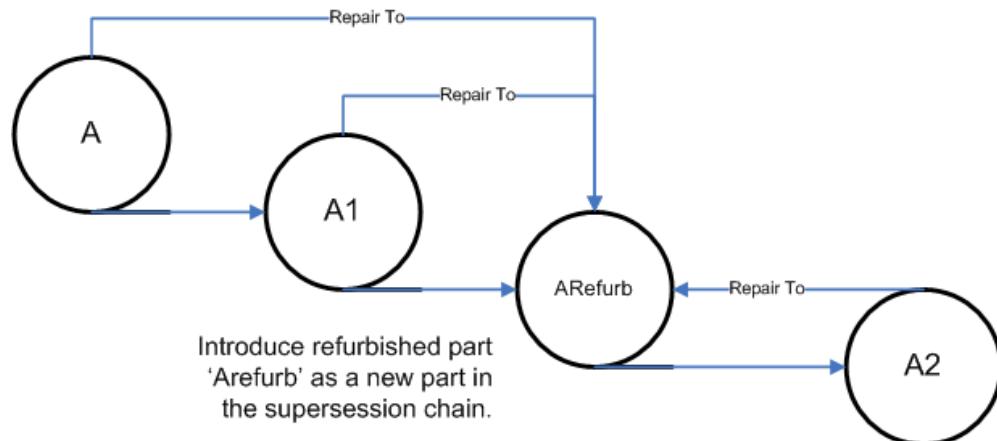
The user is responsible for reviewing the supplier capacity violation exception, and manually offloading to alternate new buy suppliers as required.

## Setting Up Refurbished Part as a New Part Number

Some organizations distinguish new service parts from the refurbished or repaired parts by creating a new part number. The service planning solution described in this document and in Spares Management considers that no difference exists between a new part and a repaired part.

To use the solution to support a process in which the repaired part is a different part number:

1. Set up the repaired or refurbished part as a supersession part and insert it in the supersession chain. Define it as a Bilateral relationship with the latest revision.  
A ->A1 ->ARefurb <- -> A2
2. After defining the refurbished part ARefurb, introduce the refurbished part as a new part in the supersession chain. Define the Repair to part for all revisions to ARefurb:



Three key business scenarios exist:

- You want to always exhaust the refurbished part prior to buying new.  
Forecast for the new part and create ISO demand for the new part. Setup refurbished part (ARefurb) as a bilateral relationship to the highest revision part in the chain (A2). Planning will always search the material from superseded parts to highest part in the chain and exhaust the supplies for ARefurb prior to using A2. Also when creating additional orders planning will generate repair orders to convert all defectives to refurbished part (ARefurb) and using that supply before ordering the new buy for the highest revision (A2).
- Technicians carry both refurbished and new buy part, and need to determine whether to use a refurbished part or a new buy part on a case by case basis.

This is the same process as in the first scenario, except typically technicians will setup min max (order policy) for both the refurbished part and the new part.

- Based on the end customer, the planning engine dynamically determines whether refurbished parts are usable. For example, as part of the contract with Customer XYZ, refurbished parts cannot be used for service. Supersession is a global definition. Thus customer-based substitution is not supported with this release.

You get the following functionality that you get by setting up a refurbished part as a new part number:

- Planning considers the existing supply for the repaired part prior to recommending supply for the new part.
- Technicians can demand either the new or the repaired part.



# Part 2

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## Using Service Parts Planning



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## General Solution Approach

This chapter covers the following topics:

- Introduction
- Service Planning Modes
- Generating Only the Plan
- Chain-Specific Online Planning

### Introduction

This part of the guide includes:

1. A description of the general solution approach, service supply chain responsibilities, and available functionality
2. Procedures for defining and generating service plans
3. Concepts for working with plans and analyzing exception messages
4. Concepts and procedures for executing service plans

The Oracle Service Parts Planning solution provides decision support for two roles in the service planning organization: the service supply chain analyst and the service supply chain planner.

### Service Supply Chain Analyst

The Service Supply Chain Analyst determines inventory item replenishment and forecasting policies.

### Service Supply Chain Planner

Business flows supported for service supply chain planners include:

- Defining forecast rules and associating items with forecast rules
- Modifying forecast parameters for a forecast method, if required
- Changing forecast methods for demand and returns forecasts
- Generating Blended forecasts based on historical data
- Generating product population-based forecasts for new products or new service contracts
- Performing Lifetime Buy for spare parts that are approaching obsolescence
- Performing replenishment and distribution planning
- Performing repair planning

The service supply chain Planner's Worksheet features:

- Integrated display: Provides demand, supply, history, inventory, comments, and exceptions in a single view.
- Multiple modes of entry into the integrated display. Enter the Planner's Worksheet from the following starting points:
  - Planner's Work List
  - Plan Summary
  - Personal Query
  - An event outside of the software that causes the planner to query the item in the worksheet.

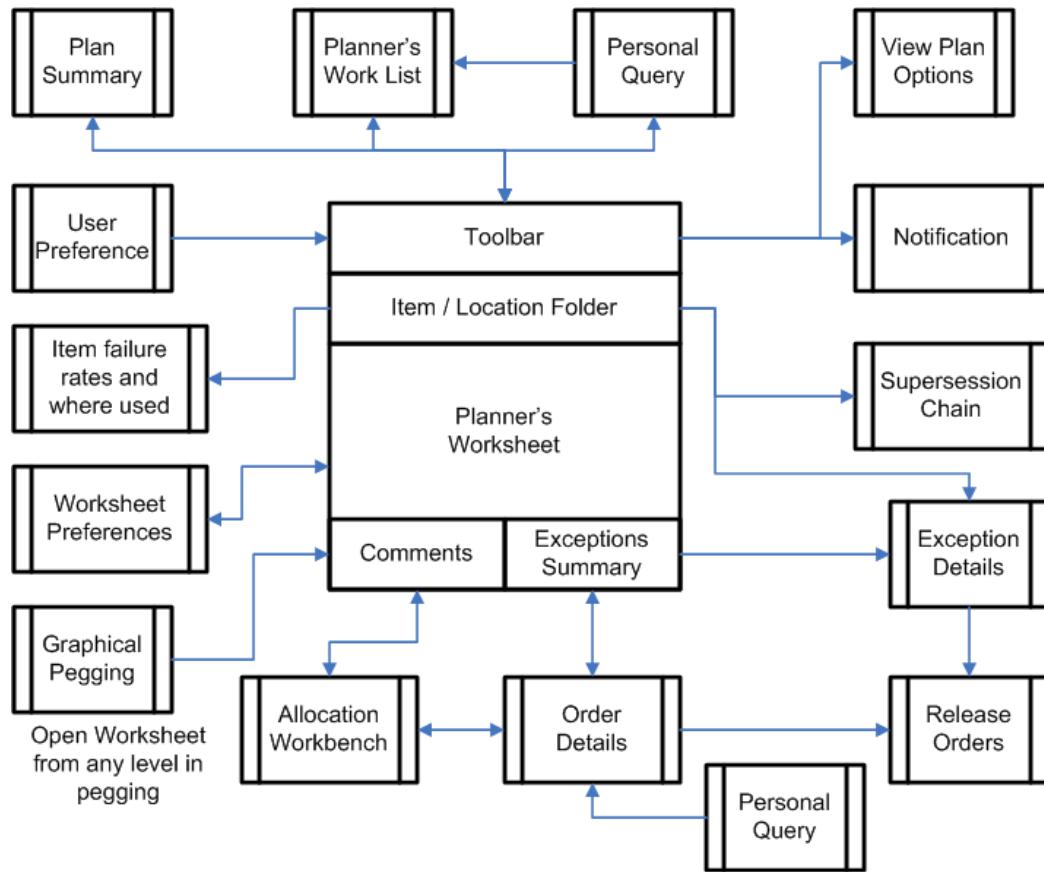
## Summary of Major Solution Elements

The user interface interactions in the Planner's Workbench include the following elements:

- SPP setup: Plan Options and Forecast Rules
- Main toolbar: Including the ability to open Planner's Work List, Plan Summary, and Personal Query
- Item/Location Folder: Lists item attributes, sourcing rules and lead times for the item. This also includes the supersession and supply chain bill for the item organization.
- Planner's Analysis Worksheet

- Supply and Demand Analysis
- Forecast Analysis
- Rows supported for Service Parts Planning, and the actions supported for each row
- User Preferences
- Order Details
- Exception Summary and Details
- Comments
- Planner's Work List
- Notifications screen

To perform multidimensional analysis from the Planner's Worksheet, Planners interact with the windows represented in the following figure:



## Service Supply Chain Planner Responsibility

Implementing Service Parts Planning provides access to the Service Supply Chain Planner Responsibility. Selecting that responsibility opens the Navigator Supply Chain Planning menu of functionality as shown in the table.

Menu	Sub Menu	Sub Sub Menu
Workflow		
Notifications		
Service Parts Planning	Workbench	
	Options	
	Names	
	Names	

---

<b>Menu</b>	<b>Sub Menu</b>	<b>Sub Sub Menu</b>
	Launch	
	View Plan	
	View Plan Options	
Collections	View Collected Data	
	Oracle Systems	Standard Collections
		Continuous Collections
		Purge Interface Tables
		Install Base History
		Service Parts Return History
		Service Parts Usage History – Depot Repair
		Service Parts Usage History – Field Service
		Shipment History
		Product Returns History
Legacy Systems	Collect Flat File Data	
		Collect Flat File Data – Self Service
		Purge Collected Data
		Purge Interface Tables
		SPP Streams – Self Service
		Shipment History – Self Service
		Load Transaction Data Using Flat Files

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<b>Menu</b>	<b>Sub Menu</b>	<b>Sub Sub Menu</b>
Sourcing	Sourcing Rules	
	Bill of Distribution	
	Assign Sourcing Rules	
	View Sourcing Rules	
	View Bill of Distribution	
	View Assignments	
	View Sourcing Hierarchy	
	View Supply Chain Bill	
ATP	ATP Inquiry	
	ATP Allocation Rule	
	Assign Allocation Rule	
	View Allocation	
Setup	Parameters	
	Forecast Rules	
	Failure Rates	
	Parts Usage	
	Advanced Forecasting Parameters	

Menu	Sub Menu	Sub Sub Menu
	Item Attributes Mass Maintenance	
	Demand Priority Rules	
	Transit Times	
	Lookups	
	User Groups	
	User Preferences	
	Run Requests	
	Manage Criticality Matrix	
Other	Requests	
	Profile	
	Change Organization	

## Service Planning Modes

- Regen Mode

In the Regen (batch) mode, the entire set of items as defined on the Plan Options is used to generate the SPP plan. The plan itself has options to generate a forecast, snapshot data from the Operational Data Store (ODS), and generate a supply plan.

Snapshot of the ODS has two options:

- Snapshot dynamic entities, and
- Snapshot static entities
- Online Replan Mode

In this case, the user starts the plan for a particular item. The generated plan uses

data only from the Planning Data Store (PDS).

- Net Change Mode

As previously noted, the Online Replan is based on a previous Regen plan that uses data from the PDS. A Net Change plan looks for changes to the ODS since the last Regen plan, and replans only that data. A Net Change plan, therefore, requires a net change collections run.

The net change collection marks changed items. If the planner runs a Complete or Targeted collection, then all collected entities will be marked as Changed, which will result in a Net Change plan that treats all items as if they were part of a batch plan.

In this mode, only eligible areas will be replanned. The following events can make an area eligible for planning:

- Changes to item attributes
- Changes to Supply
- Changes to Demand
- Changes to the selected set of items
- Initiation of the forecast frequency

#### ***Plan Actions Supported***

<b>Mode</b>	<b>Generate Forecast</b>	<b>Generate Supply Plan (Launch Planner)</b>	<b>ODS Snapshot</b>	<b>PDS Snapshot</b>
Regen (Batch)	Supported	Supported	Supported	Supported
Online Replan (Interactive)	Supported	Supported	Not Supported	Supported
Net Change	Supported	Supported	Supported	Not Supported

As shown in the previous table, all three modes allow generation of a forecast and a supply plan. Online mode, however, does not support the ODS Snapshot because the data only comes from the PDS. In Net Change mode, PDS Snapshot is not supported.

Running the plan in batch, net change, or interactive mode does not include automatically running the inventory plan and regenerating the safety stock policies.

## Regen Planning

In this mode, all parts within the scope of the plan are planned. If the Generate Inline Forecast option is enabled (set to Yes), then forecasts for all the parts in the scope of the plan are regenerated, regardless of whether the time period specified in the Forecast Frequency field has been achieved.

## Online (Incremental or Interactive) Replanning

A service planner may need to recalculate the plan to see the effects of implementing actions. These actions can be grouped as:

- Corrections or changes to *demand*
- Corrections or changes to *supply*
- Corrections or changes to *supply chain definitions*, such as sourcing rules

While evaluating actions related to *demand*, the planner can:

- Change the forecast method by changing the forecast rule
- Add, delete, or change forecast parameters for the forecasting method chosen as part of the forecast rule
- Manually adjust or override demand forecasts

When taking corrective actions related to the *supply*, the planner can:

- For returns forecast
  - Change the forecast method.
  - Add, delete, or change forecast parameters for the chosen forecasting method.
  - Manually adjust or override returns forecasts.
- Add, delete, or change sourcing (repair, new buy, transfer) in the destination.
- Add or change an existing order, add new buy transfer or repair order, or change quantity or dates for planned orders
- Manually perform supply allocation based on fair share.
- Change supplier attributes (lead times) and supplier capacities.

## Scope of Online Replanning

After making changes to plan attributes, click the 'Replan' icon to display the Replan Options window. Here you can specify whether to regenerate forecasts or recalculate supplies before starting the planner. Items that have changed since the last run are identified and replanned. If no qualifying changes are available when online planning is invoked, then the warning message *Nothing to replan* appears.

See Replan Options, page 9-37 window.

Multiple planners can simultaneously initiate replanning for the sets of items they are assigned. All replanning actions spawn a new process to generate plans for the set of items that the planner designates. As long as the sets of items are different, they can be planned simultaneously. If a set of items is already being planned, that is, the Planner is running, then the user encounters a warning message stating that the items are already being planned. If the planner decides to initiate a replan for a set of items that is currently being planned, then the new request will wait until the current plan has finished before the next plan is started.

You can navigate to other forms while online planning is running, however you will not be able to make any changes until the online planner completes its processes. The user interface automatically refreshes when online planning is complete. If you have queried other items since starting the replan, then the refresh of the Supply and Demand Analysis (SDA) window is done when the changed item is re-queried. If you stay on the same item, then an automatic refresh of the window is done upon completion of the replan. In this case, a message appears at the bottom of the window to indicate that the SDA has been refreshed after the replan.

For example, if you replan item A, and stay on item A until the replan is done, then SDA is refreshed. If you replan item A, but move to item B, when the replan of A is done, SDA for item A is not refreshed. When you re-query item A, the replanned information appears.

See Supply Demand Analysis Worksheet, page 9-4.

**Note:** Running the plan does not include automatically running the inventory plan or regenerating safety stock policies. See Safety Stock Calculations., page 11-1

## Permitted Changes for Online Planner

The objective of the Online Planner is to allow a planner to make changes in a simulation mode, run the plan, evaluate the effect of the changes, and, if required, incorporate the changes back into the base plan. The Online Planner therefore runs on top of a base plan; it only uses changes to the Planning Data Store (PDS) from the last plan run.

This section lists the permitted changes that will be picked up by Online Planner when it is invoked. These changes can be grouped as follows:

- Corrections or changes to Demand
  - Change the forecast method by changing the forecast rule.
  - Add, delete, or change forecast parameters for the forecast method chosen as part of the forecast rule.
    - Upon changing the failure rates or product-specific population, users can replan and recalculate the failure/return rate forecast.
  - Override the forecasts.
    - Adding a demand
    - Removing a demand
    - Changing the demand date
    - Changing the demand quantity
    - Changing the demand priority
- Corrections or changes to Supply
  - For returns forecast:
    - Change the forecast rule.
    - Add, delete, or change forecast parameters for the forecast method chosen.
    - Add manual forecast adjustments and overrides.
  - Add or change an existing order. For New buy, Transfer, or Repair orders:
    - Add a supply.
    - Remove a supply.
    - Change the supply date.
    - Change the supply quantity.
    - Firm a supply.
  - Change supplier attributes (lead-times) and supplier capacities.

## Net Change Planning

Net Change mode allows the planner to modify forecasting rules and time windows, and when the plan is relaunched, only those parts that are eligible for planning will be updated. Eligibility is determined by the frequencies defined in the forecast rules for each item-organization.

For example, assume that the frequency of the plan is defined as follows:

Forecast Rule/Item Association	Frequency	Bucket
All items	6	Periods
A class	2	Weeks
B class	1	Month
C class	3	Months
Critical	1	Day

In the above example, parts belonging to the logical group Critical will be planned every day, whereas parts belonging to the logical group A class will be planned every two weeks. All parts will be planned once every six months.

If no frequency is defined for an item, then the plan for that item will be updated every time it is run.

For replenishment planning, a planner can specify the changes that should trigger replanning for an item. These changes include:

### **Change in demand**

1. New orders (Outbound shipment - External organization)
2. Change in forecast or new forecast
3. New sales orders
4. Order cancellation
5. Shipment

### **Change in supply**

1. PO receipt

2. New order (buy, transfer, or repair order)
3. On Hand Change (any nettable sub inventory)

#### **Change in static data**

1. Lead-time changes (changes to attributes on the items Lead-times tab)
2. Changes in ASL for new buy and repair suppliers
3. Sourcing rules/Assignment set for the plan
4. Supersession definition changes
5. Changes to attributes on the Items Planning tab

## **Generating Only the Plan**

You can start the planner only, without necessarily having to generate the inline forecast. In this case (with a full snapshot), all the data in the planning database is overwritten. The inline forecast from the previous stage is fed in to the plan as a demand schedule.

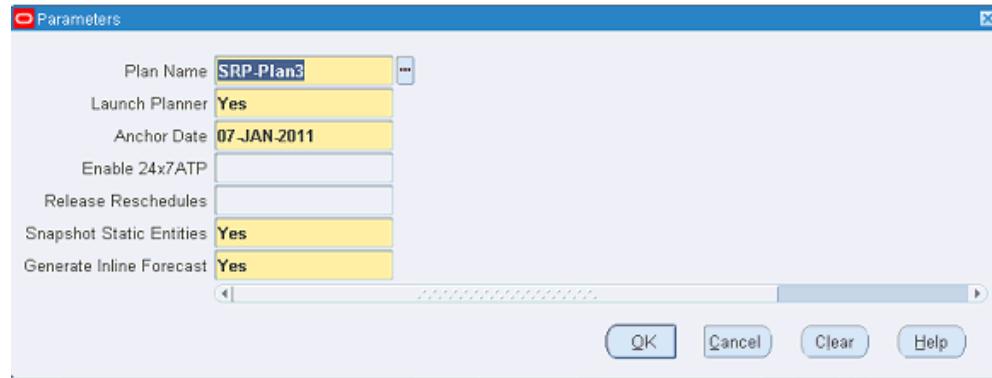
**Note:** You can not generate a forecast only.

#### **To generate a plan only:**

1. From the Service Supply Chain Planner responsibility, navigate to the Parameters window.

Service Parts Planning > Launch

The Parameters window appears in front of the Launch SPP Plan window.



2. On the Parameters window:
  - Enter the Plan Name.
  - Set Launch Planner to Yes.
  - Set Generate Inline Forecast to No.
3. Click OK.

### **Plan Options and SPP Planning Modes:**

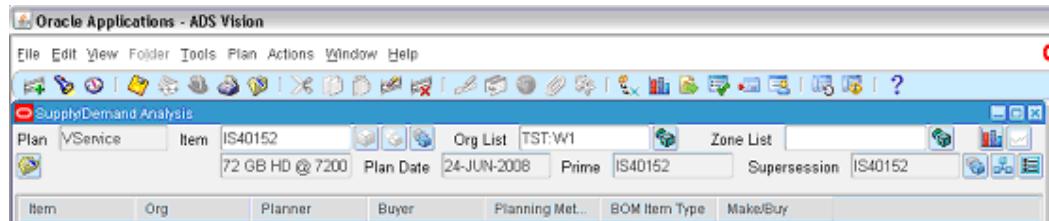
You can choose to run a Regen (Batch) mode plan, and later make incremental corrections using Online (Interactive) planning.

When you start the snapshot in the interactive mode, planning uses the Plan Options definitions as of that moment. If you change the Plan Options, subsequent replans use the changed plan option definitions. See Service Supply Chain Plan Options, page 8-2.

## **Chain-Specific Online Planning**

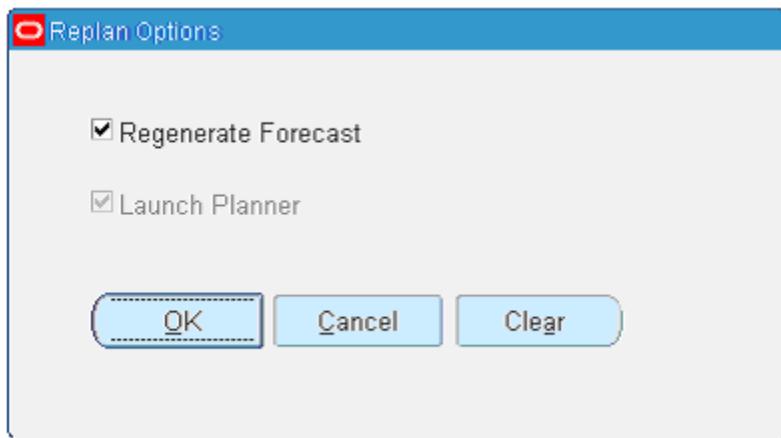
This functionality replaces a previous behavior in which the online planning process picked up all items with changed orders for the replan. That means that if multiple planners worked simultaneously on different items, when one planner initiated a replan, item changes from all planners would go into effect. Now, the online planner replans only a single supersession chain.

The process begins when the planner makes changes and clicks the online planner icon on the Supply Demand Analysis page.



This icon is grayed out if any other window is in focus (it is highlighted only when the Supply Demand Analysis window is in focus) or if a replan process is currently running for that item, for example, if a replan of the same item-supersession chain was initiated by another planner.

After clicking this icon, the Replan Options window appears.



The Replan Options window displays the ID of the specific item-supersession chain that will be replanned. It also provides the option to regenerate the forecast. The Launch Planner check box is always selected and grayed out because, in either case, the online planner must be launched.

When the user selects OK, the online planner is launched. Note that the entire supersession chain for the item will be replanned, even if the Supply Demand Analysis window is opened at the item or the prime level. This action will include all Organizations and Zones for that item-supersession chain. It also will include any changes made to that same item by different planners.



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## Defining Service Plans

This chapter covers the following topics:

- Service Supply Chain Plan Name
- Service Supply Chain Plan Options
- Item Simulation Set (Mass Maintenance)
- Creating Item Simulation Sets
- Reverting to Original Values
- Item Simulation Set Example
- Updateable Attributes List
- Criticality Matrix
- Setting the MSC:Criticality Category Set Profile Option
- Criticality Rules
- Creating and Executing a Criticality Query

### Service Supply Chain Plan Name

You use the Service Plan Names form for defining multiple plans, and storing them against plan names. You can access the Service Plan Names form from the Service Supply Chain Planner responsibility Navigator.

Service Parts Planning > Names

The design and uses of this form are similar to those of the DRP Plan Name form, except that the Plan Type value is Service Plan. You cannot update the Plan Type field. The Plan Type Service Plan is not visible to Distribution Requirements Planning (DRP). Similarly DRP plans are not visible to SPP. Inventory Optimization users can see and use DRP and SPP plan types, but cannot generate plans based on a mix of definitions from both plan types.

Name	Description	Notifications	Plan Type	Inactive Date
172934Copy	Copy plan of AVP-oct15A	<input type="checkbox"/>	Service Plan	
172934cp	copy of AVP-oct15A - Firstrun 30-Oct-20	<input type="checkbox"/>	Service Plan	
173934cp	copy of AVP-oct15B - Firstrun 24-Oct-20	<input type="checkbox"/>	Service Plan	
6449090ORI	KSSRPPLN19 original copy	<input checked="" type="checkbox"/>	Service Plan	
6449090new	KSSRPPLN19 using new assignment se	<input checked="" type="checkbox"/>	Service Plan	
AA4Z	Copy of BJ-SRP4X 30-Oct w/O reservatio	<input type="checkbox"/>	Service Plan	
AASRP4Z	Copy of BJ-SRP4X 30-Oct w/O reservatio	<input type="checkbox"/>	Service Plan	
AK-21sep2	SRP-plan 1 NCR other ast set	<input type="checkbox"/>	Service Plan	
AK-SRP16E	w/ GLFCfrom DP, assin at category-inst	<input type="checkbox"/>	Service Plan	
AK-SRP16F	With Global demand schedule from DP	<input type="checkbox"/>	Service Plan	

[Copy Plan](#) [Launch Plan](#) [Plan Options](#)

## Service Supply Chain Plan Options

You specify plan options to define the scope of the named plan, and control many aspects of the plan generation.

You can access Plan Options in one of the following ways:

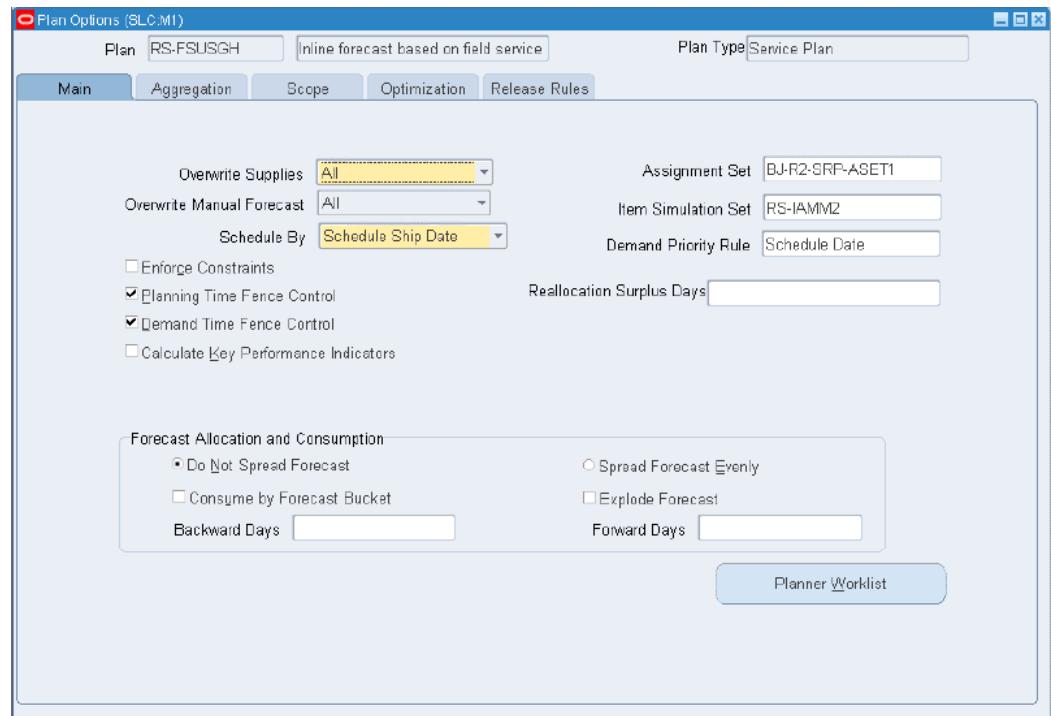
- From Service Plan Names, select a plan, and then click Plan Options
- From the Service Supply Chain Planner (responsibility) Navigator, select Service Parts Planning > Options

For more information about Plan Options, see Setting Distribution Plan Options, in the Defining Distribution Plans Chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

When you navigate to Plan Options from the navigator, a Find window opens for you to specify the Plan name for which you want to see the plan options.

## Main Tab

On the Main tab you specify assignment set, item simulation set, demand priority rule, whether to overwrite supplies and manual forecasts, which type of date to schedule by, whether to enforce constraints and time fences, and so on.



Field	Validation	Description	Default
Overwrite Supplies	LOV – All, Outside planning time fence, and None	Defines which planning can overwrite supplies.	All
Overwrite manual forecast	LOV – All, Outside planning time fence, and None	Defines whether planning considers manual override entries for the forecast. This option is valid only for considering the row type Manual override.	All

Field	Validation	Description	Default
Schedule By	LOV – Schedule Ship Date, Schedule Arrival Date, Request Ship Date, Request Arrival Date, Promise Ship Date, Promise Arrival Date	<p>Set this option to instruct the planning engine to:</p> <ul style="list-style-type: none"> <li>- Plan supplies based on sales order line request, promise, or schedule dates for either ship or arrival</li> <li>- Consume forecasts based on sales order line request, promise, or schedule dates. You must provide forecast dates that match your choice of this plan option; for example, if you select Promise Ship date for this plan option, make sure your forecast dates are in terms of promise ship dates.</li> </ul> <p>Select one of the following sales order line dates:</p> <ul style="list-style-type: none"> <li>- Schedule Ship Date</li> <li>- Schedule Arrival Date</li> <li>- Request Ship Date</li> <li>- Request Arrival Date</li> <li>- Promise Ship Date</li> <li>- Promise Arrival Date</li> </ul> <p>The default is Schedule Ship Date.</p> <p>For forecast consumption, the planning engine uses:</p> <ul style="list-style-type: none"> <li>- Schedule Date if you select Schedule Ship Date or Schedule Arrival Date</li> <li>- Request Date if you select Request Ship Date or Request Arrival Date</li> <li>- Promise Date if you select Promise Ship Date or Promise Arrival Date.</li> </ul> <p>If you do not specify plan option Demand Priority Rule and have not specified a default demand priority rule (in the Define Priority Ruled</p>	Schedule Ship Date

Field	Validation	Description	Default
		form), the planning engine uses the value of this plan option as the demand priority rule.	
Enforce Constraints	Yes/No check box	Determines whether to consider capacity and lead-time constraints. Select if you want material and resource capacity constraints to be respected in lieu of demand due date constraints if a conflict exists.	No
Planning Time Fence Control	Yes/No check box	Determines whether exception messages can be executed within the time fence. Select this option to enforce demand time fence control.	No
Demand Time Fence Control	Yes/No check box	Within this time fence, forecast demand is set to zero. Select this option to enforce planning time fence control.	No
Assignment Set	LOV– All assignment sets	Use this option to select an assignment set that holds the sourcing rules and bills of distribution that define the rules for material flow within your supply chain.	Null
Item Simulation Set	LOV – Item simulation sets	Select a simulation set from the list of values. A simulation set is a set of adjustments to the base. You can define different simulation sets to model different scenarios.	Collected or Null, in which case planning uses collected data.

Field	Validation	Description	Default
Demand Priority Rule	Demand Class Priority Rule Set	Demand Priority Rule for each plan. Demand priorities are set by demand class and demand type. Priorities are assigned to sales orders and forecasts. End demand priorities are passed down the supply chain network on the dependent demands. If you prefer, you can enter priorities for each demand in the source instance or load priorities for each demand into the ODS using SQL tools. When you select the demand priority rule set in the plan options form, one of the choices is user defined priorities. If user defined priorities is selected, Service Planning uses the demand priorities entered for each demand.	Null
Reallocation Surplus Days	Number	Reallocation messages are not suggested unless surplus occurs for this quantity of days	Null
Forecast Allocation and Consumption related fields	Region	Determines the behavior of forecast allocation, consumption and whether forecasts are spread beyond the time fence.	
Do Not Spread Forecast		The planning engine should use forecast entries as they exist for planning.	
Spread Forecast Evenly		The planning engine should spread aggregate forecast demand evenly across the daily buckets from the workday calendar.	
Consume by Forecast Bucket		The forecast consumption process does not search outside of the consumption bucket for forecasts and sales orders except in daily buckets.	

Field	Validation	Description	Default
Explode Forecast		<p>Select to instruct the planning engine to explode forecasts as follows during the consumption process:</p> <ul style="list-style-type: none"> <li>- Product family forecasts to product family member item forecasts</li> <li>- Model forecasts to other model, option class, and item forecasts.</li> </ul> <p>This option applies to forecasts with forecast control consume and derive. If you clear this plan option, you have arranged for this explosion to occur in the source instance or in Oracle Demantra Demand Management before the planning run.</p>	
Backward Days		<p>This parameter allows a sales order demand to consume forecast demand even if the forecast demand is up to the specified number of days earlier than the sales order demand. It applies only to the supply chain planning forecast and not to Oracle Demand Planning forecast scenarios.</p>	
Forward Days		<p>This parameter allows a sales order demand to consume forecast demand even if the forecast demand is up to the specified number of days later than the sales order demand. It applies only to the supply chain planning forecast and not to Oracle Demand Planning forecast scenarios.</p>	
Planner Worklist (button)	Planner work list groups created by this user plus those planner work list groups to which the planner is included.	<p>This button opens a new window where work lists can be defined. See Specifying Planner Work Lists as Part of Plan Run</p>	

#### See

- Reverse Logistics Assignment Sets, page 6-22

- Item Simulation Set, page 8-15
- Demand Priority, page 6-22

## Aggregation Tab

On the Aggregation tab, you specify the planning period and how it is divided into time buckets. You also specify whether circular sourcing is enabled.

Field	Validation	Description	Default
Plan Start Date	Date	Start date for the plan. If you have never run the plan, this field displays today's date. If you have run the plan, this field displays the planning horizon start date of the last run.	sysdate
Plan End Date	Date	End date of the plan horizon. Calculated planning horizon end date based on your entries in Buckets and the owning organization calendar.	
Start Date		Calculated start date for each bucket based on your entries in buckets and the owning organization calendar. The value for the Days column is the plan start date.	

Field	Validation	Description	Default
Time Buckets Days, Weeks, Periods	Integer	Telescopic planning horizon capability – Number of daily, weekly, and monthly time buckets within the planning horizon. Weekly buckets can start only on the week beginning day from the manufacturing calendar. If the daily horizon does not end on the day before a week beginning day, the planning engine extends it to the next day before a week beginning day. It plans the extended days in daily buckets, never minute or hourly buckets, regardless of any other settings.	
Circular Sourcing Enabled	Yes/No check box	Determines whether planning recommends transfer of supplies from existing inventory at other organizations	No
Circular Sourcing Surplus Days	Integer	Transfers are not recommended unless surplus exists for this quantity of days	

### Daily Allocation Buckets

Daily allocation buckets are the number of buckets during which the allocation bucket size is one day. Null or zero value means that no daily allocation buckets are available. You must specify that the number of daily allocation buckets is less than or equal to the number of daily planning buckets.

Weeks per aggregate allocation bucket is the number of weeks contained in each aggregate allocation bucket. It can be an integer only. If the weeks per aggregate allocation bucket is two or more, then the last allocation bucket cannot contain that number of weeks (depending on how many weeks are left before the plan horizon end date). For example, if weeks per allocation bucket is two, but the plan horizon only allows one week in the last allocation bucket, only one week is used.

The plan horizon is not extended because of the allocation buckets. If daily allocation buckets exist, the aggregate buckets start on the next week start date and additional daily allocation buckets can be used. For example, if the daily allocation buckets end on a Thursday and the week start date is Monday, one additional daily allocation bucket is used (assuming that Saturday and Sunday are nonworking days).

Supply allocation proceeds bucket by bucket. Demands in the first bucket (daily, weekly or period) are sorted by priority and firm demands are given the highest priority. Within the bucket, for each demand priority, demands are allocated supplies

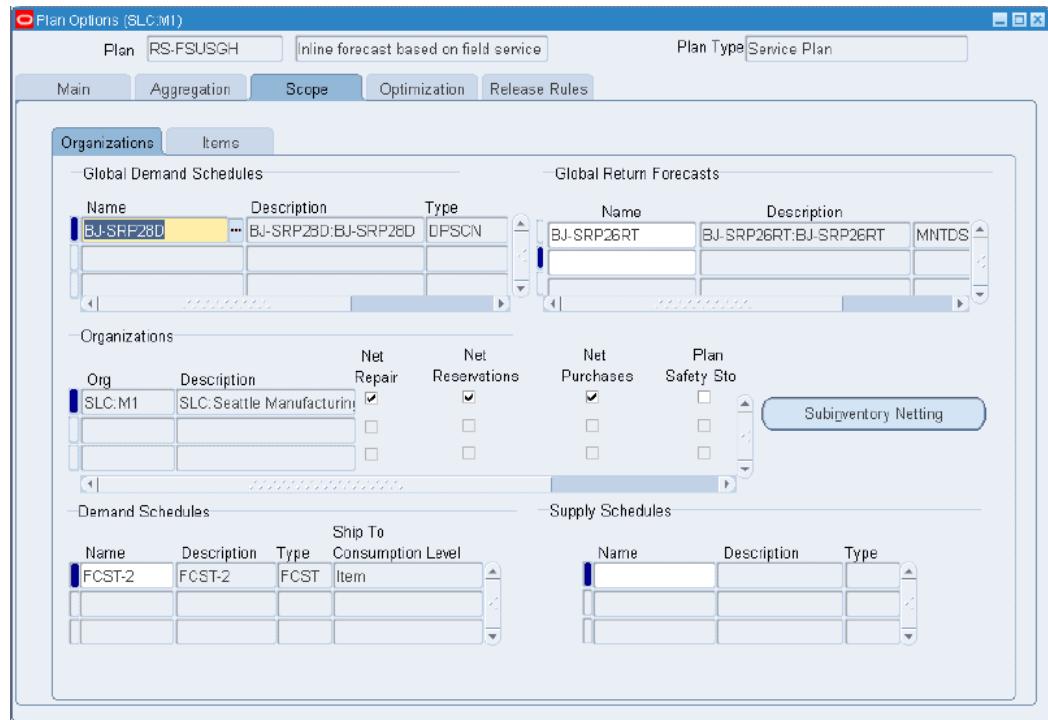
on or before the demand date. If supplies are not available by the demand date, then they are allocated by the bucket end date. If a shortage occurs for a demand priority within an allocation bucket, the supplies are fair shared based on the supply allocation rules and plan options. Unsatisfied demands are carried forward to the next allocation bucket.

Inventory Rebalancing - Circular Sourcing, page 6-15

## Scope Tab

The organizations and items included in the supply chain define the scope of the service plan.

### Organizations Sub Tab



Field Group	Validation	Description
Global Demand Schedules	The global demand schedules appear in the LOV.	Select the names of Oracle Demantra Demand Management scenarios that drive this plan. You can select scenarios that do not reference an organization (organization dimension set to All Organization).

Field Group	Validation	Description
Global Returns Forecasts	The global returns forecasts appear in the LOV.	Indicates the scenario for returns forecast. This is similar to global demand forecast, but to indicate returns, planning marks the scenario as returns.
Organizations	Field organizations are not part of the LOV.	
Demand Schedules	The local demand schedules and forecasts appear in the LOV.	Select the names of demand schedules, forecasts, and plans that drive this plan.
Supply Schedules	LOV includes forecast scenarios for return forecast as supply schedule	Select the name of supply schedules that participate in this plan. Note that this production schedule should be referencing this plan within its schedule options. That is, the schedule name that is entered should reference the plan on the Schedule Options page, Scope tab.

## Items Sub Tab

The Plan Options form Items sub tab provides attributes for specifying whether planning includes all items, all items from all categories within a specified category set, or items from listed categories within a specified category set.

First, you either select the **Include All Items** radio button, or the **Include Items from the Following Category Set** radio button. Choosing to include all items disables entry for category set and category.

Selecting the **Include Items from the Following Category Set** radio button enables the **Include All Categories** check box. Selecting this check box requires a choice from the LOV to specify a category set. These settings cause all items in all categories of the specified category set to be included in the plan.

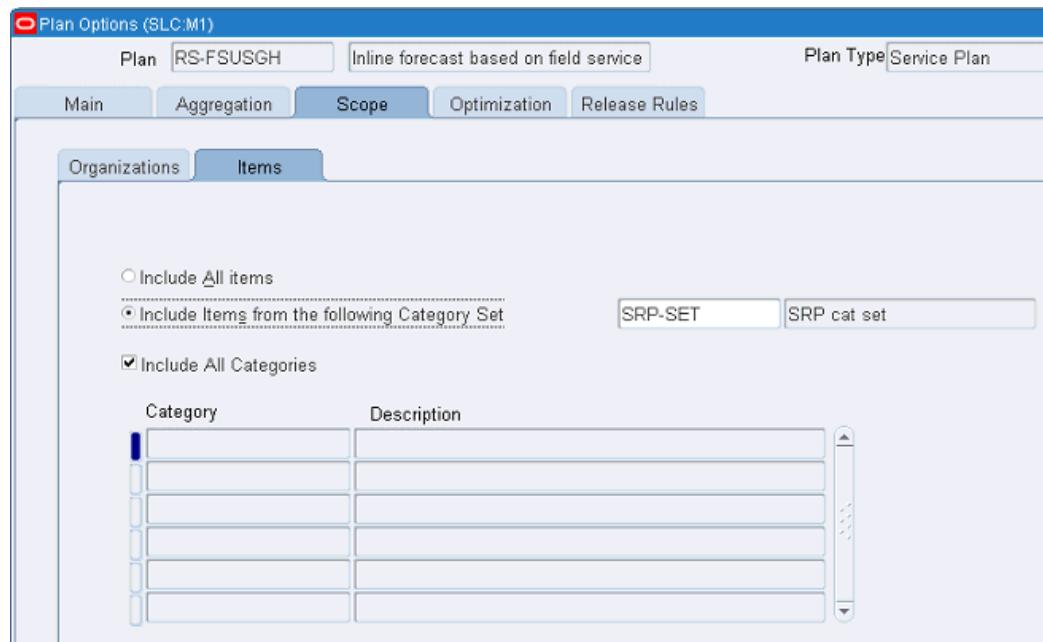
When the **Include Items from the following Category Set** radio button is selected, and the **Include All Categories** check box is not selected, then you can choose from the Categories LOV to specify categories within the category set. These settings cause all items in listed categories of the specified category set to be included in the plan.

You cannot select multiple category sets. Once a category set is changed from the current category set, all categories are deleted from the lower part of the form.

Subsequent attempts to change the category set of a saved plan encounter a warning.

Planning verifies and includes all related items in the plan, such as:

- All items in the supersession chain for the selected item, regardless of the category of these items.
- In case of a Depot Repair work order for the selected item, all dependent demand component items.
- All the supplies generated by the plan.



Field	Validation	Description	Default
Include All items	Yes/No radio button	Indicates whether the plan should include all items	Yes
Include Items from the following Category Set	If include all items = No LOV includes all categories	Select the category set that contains the items you want to plan	No
Include All Categories	Yes/No check box	Include all items in all categories in the specified category set	No

Field	Validation	Description	Default
Category	LOV of categories within the specified category set	Include all items in listed categories in the specified category set	Null
Description		Displays the description of the selected category	Null

## Optimization Tab

Select the Optimize check box to enable the optimization tab, and then specify relative weights for the objectives. Valid objective weights range from zero to one.

For example, the following settings would favor plans that achieve high customer service (on-time delivery) at the cost of increased investment in inventory (low inventory turnover ratio):

- Maximize inventory turns = 0.2
- Maximize plan profit = 0.4
- Maximize on-time delivery = 0.9

**Note:** The weights do not necessarily sum to 1.0. Also note that the relative weights indicate your preferences among these competing objectives. Thus, setting all these weights to 1.0 produces the same result as setting them all to zero.

You can also define Plan Level Penalty Factors, in percent, for exceeding material capacity, exceeding transportation capacity, and demand lateness. This action causes the planning engine to search for alternatives that minimize the total of these penalties.



Field	Validation	Description	Default
Maximize inventory turns	Number >= 0, <= 1	Specify a weighting factor from 0 to 1.	0
Maximize plan profit	Number >= 0, <= 1	Specify a weighting factor from 0 to 1.	0
Maximize on-time delivery	Number >= 0, <= 1	Specify a weighting factor from 0 to 1.	0
Exceeding material capacity %	Positive Number	Enter a numerical value to quantify the impact of exceeding material capacity. For example, if you enter 20, the penalty factor is 20%.	0
Exceeding transportation capacity %	Positive Number	Enter a numerical value to quantify the impact of exceeding transportation capacity. For example, if you enter 30, the penalty factor is 30%.	0
	Positive Number	Enter a numerical value to quantify the impact of late demand. For example, if you enter 40, the penalty factor is 40%.	0

## Release Rules Tab



The plan setup provides the following options for releasing orders:

- The default selection is Do not Auto-Release orders in the plan. In this case, planners manually release planned orders.
- Automatically Release All Planned Orders in the plan that lie within their associated release time fence. No rules are evaluated prior to release.

## Item Simulation Set (Mass Maintenance)

Mass maintenance functionality stores updated records separately from the collected data against the item simulation set name. The updated data overlays collected data. See the Item Simulation Set Example, page 8-19.

When a plan is run using a specified item simulation set, the plan uses item attribute values as they have been manipulated in the Item Attributes Mass Maintenance window for the named item simulation set. You can create multiple named sets of modified data, and then use them for simulating alternative plan scenarios.

## Creating Item Simulation Sets

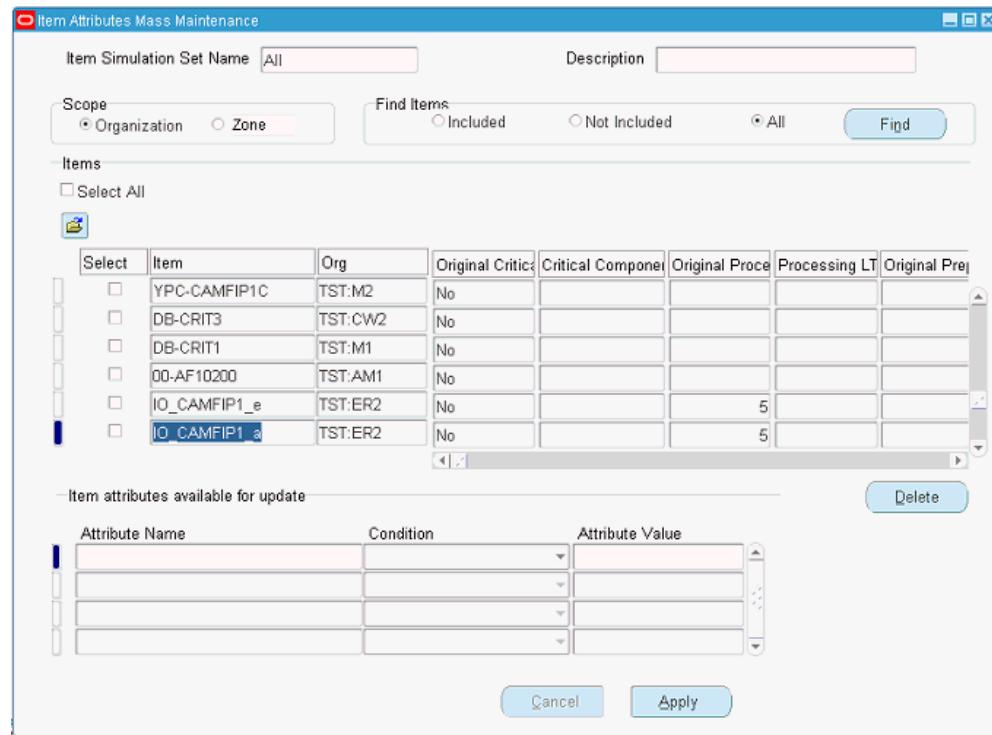
Item simulation sets created with the SPP responsibility are internally tagged as SPP simulation sets. Only SPP simulation sets appear in the SPP plan options LOV. Only the columns that are specific to SPP appear.

**Note:** Inventory Optimization users can use both ASCP and SPP simulation sets. However, because only one simulation set can be used per plan, Inventory Optimization users cannot use part of the changes made in an ASCP simulation set, and part of the changes made in a SPP simulation set.

## **Navigate to the Item Attributes Mass Maintenance window:**

1. From the Service Supply Chain Planner responsibility, navigate to the Item Attributes Mass Maintenance window.

Setup > Item Attributes Mass Maintenance



When you open the Item Attributes Mass Maintenance window from the Service Supply Chain Planner responsibility, you can either open an existing item simulation set or create a new item simulation set.

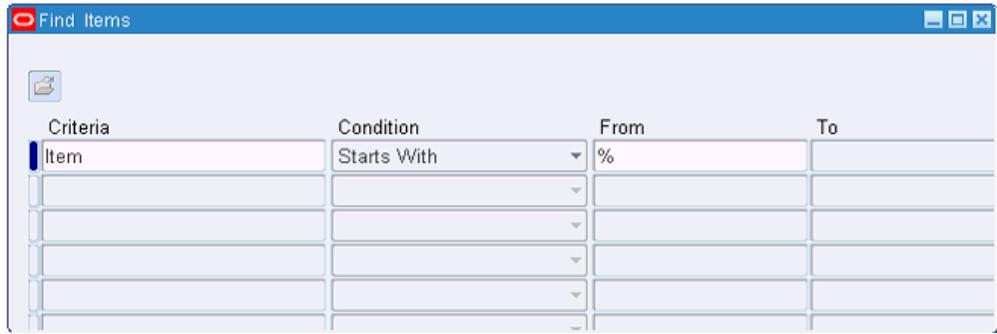
2. To access records for an existing item simulation set, in the header region, query the Item Simulation Set Name field, and then choose one of the existing item simulation sets.

The window is populated with information about the existing simulation set.

3. To create a new simulation set, in the header region, enter a unique name, and optionally a description, in the Item Simulation Set Name and Description fields.
4. To create a new simulation set, in the Scope region, you select either the Organization or the Zone radio button to define attributes at either the organization or zone level. All updateable attributes can be defined at the organization level. Only forecast attributes can be defined at the zone level. The only applicable item-zone attributes are the forecast rule for demand and supply, the sourcing rule related attributes, and the forecast accuracy metric and value.

5. In the Find Items region, click the Find button.

The Find Items window appears. You can create new find criteria, or use existing criteria to search for item and organization combinations. The find criteria includes the destination-only item attributes, page 8-25 and the updated item attribute, page 8-18, which indicates whether any attribute has changed.



6. Define Find Items criteria to retrieve items for which you want to set Item Attributes values in this named Item Simulation Set. Click Find.

The Items region is populated with items that match the find items criteria.

7. In the Items region select a found item.
8. In the Item attributes available for update region, the Attribute Name column list of values shows item attributes that you can update by using mass maintenance functionality. See the Updatable Attributes List, page 8-21. Select an updateable attribute from the LOV.
9. Select the Condition, and then specify the Attribute Value. The Condition operator works with the Attribute Value to modify the original value. For example, depending on the Condition operator, setting the Attribute Value to '10' could overwrite the original attribute value with 10, increase the original value by 10, or decrease the original value by 10 percent. You select the Condition from the following list of values:
  - Set Value to
  - Increase by value
  - Increase by percentage
  - Decrease by value
  - Decrease by percentage
  - Set Original value

For more information about setting values for Item Attributes Available for Update, see:

- Defining Destination Instance Item Attributes, page 2-12
- Setting the Intermittent Demand Inventory Item Attribute, page 5-23
- Associating Forecast Rules with Items, page 5-23
- Setting Up Life Time Buy Functionality, page 5-25

### **Deleting Item Simulation Sets:**

You can delete all simulation sets except the seeded simulation set named *Collected*. In the *Collected* simulation set, you can delete only rows that you have created. Select the row, and then click the Delete button. This action deletes your updates, and reverts the Updated attribute value to No.

### **Folder Functionality:**

This form provides folder functionality for managing lists of returned records. The find criteria in the folder for mass maintenance includes all the updateable attributes using either the original or updated attribute values.

For example:

Planner equals User2 and Original Planner equals User1.

### **Updated Item AttributelItem Attribute:**

In the item simulation set, the field labeled Updated indicates whether updateable item attributes have changed. You can use this field as one of the criteria to find updated (or nonupdated) item-organization combinations in the collected data.

## **Reverting to Original Values**

For all the items that can be updated, the Original field retains the data for these attributes as originally collected. For example, the item attribute Critical Component has a related attribute called Original Critical Component that stores the collected data value. The original attribute always points to the latest collected data. The attribute itself, such as Critical Component, holds the updated values.

In the case of the seeded item simulation set named *Collected*, the original and the actual attributes are the same.

### **Reverting All Attribute Values:**

To change all of the attributes for an item-organization back to original values, that is, to restore the data as collected from the source for that item and organization combination,

select the row for the item-organization. Then click Delete to delete the selected row from the simulation set.

#### **Revert One Attribute Value:**

To change one or a subset of attributes for an item-organization back to their original values, select the rows for the item-organization combinations to be restored. In the Item attributes available for update region, select the row for the attribute that you want to change to the original value. In the Condition column, select the operator Set Original Value. This action replaces the updated attribute value from the simulation set data with the collected value. Planning uses the collected value.

**Note:** The Updated attribute reverts to No only after all the attribute updates are deleted for that item-organization combination.

## **Item Simulation Set Example**

1. The user queries Item Attributes Mass Maintenance Simulation Set Name 1 to retrieve the following set of items, organizations, and attributes:

#### *Original collected data*

Item	Updated	Org	Repair Yield	Forecast Set for Demand
Aaa	No	M1	100%	Single exponential
Aaa	No	M2	90%	Single exponential
Aaa	No	M3	90%	Single exponential

2. The user makes the following changes to updatable item attributes, and saves the data.

Item: Aaa

Organization: M1

Row 1

Attribute Name: Repair Yield

Condition: Decrease value by percent

Attribute Value: 50

Row 2

Attribute Name: Forecast set for demand

Condition: Set value to

Attribute Value: Double exponential

-----

Item: Aaa

Organization: M3

Row 1

Attribute Name: Repair Yield

Condition: Set value to

Attribute Value: 50

3. All item and organization combinations that have changes are saved along with the corresponding changed attributes and attribute values. The user verifies the updated data by opening the Item Update window. The user also sees other item and organization combinations that were not changed.

***Resulting data with updates overlying collected data***

Item	Updated	Org	Repair Yield	Forecast Set for Demand
Aaa	Yes	M1	50%	Double exponential
Aaa	No	M2	90%	Single exponential
Aaa	Yes	M3	50%	Single exponential

4. In the *source instance* organization M2, the repair yield for item Aaa is changed to 80%. This data is collected.
5. A plan that is run using item simulation set 1 uses the following data.

***Resulting data with new collection data and updates overlying collected data***

Item	Updated	Org	Repair Yield	Forecast Set for Demand
Aaa	Yes	M1	50%	Double exponential
Aaa	No	M2	80%	Single exponential

Item	Updated	Org	Repair Yield	Forecast Set for Demand
Aaa	Yes	M3	50%	Single exponential

## Updateable Attributes List

The following table lists attributes that can be updated using item attributes mass maintenance.

Item Attribute	Edit in ODS	Validation
Critical Component	Yes	Yes or No
Preprocessing LT	Yes	Number
Processing LT	Yes	Number
Post processing. LT	Yes	Number
Fixed LT	Yes	Number
Variable LT	Yes	Number
Fixed Order Quantity	Yes	Number
Fixed Days Supply	Yes	Number
Shrinkage Rate	Yes	Number
Fixed Lot Multiple	Yes	Number
Minimum Order Quantity	Yes	Number
Maximum Order Quantity	Yes	Number
Carrying Cost	Yes	Number
Demand Time Fence Days	Yes	Number

Item Attribute	Edit in ODS	Validation
Forecast Control	Yes	LOV: None, Consume, Consume and Derive
Planning Time Fence Days	Yes	Number
Standard Cost	Yes	Number
Net Selling Price	<b>No</b>	Number
PIP Flag	Yes	Yes or No
Selling Price	Yes	Number
Substitution Window	Yes	Number
Safety Stock Days	Yes	Number
Unit Weight	Yes	Number
Unit Volume	Yes	Number
Safety Stock Method	Yes	
Safety Stock Percent	Yes	Number
ABC Class	Yes	LOV from Valid collected ABC Classes
Planning Method	Yes	Not planned, MRP planned, MPS planned, MPP planned, MRP/MPP planned, MPS/MPP planned
DRP Planned	Yes	Yes or No
Max Inventory Days of Supply		Number
Max Inventory Window	Yes	Number
Target Inventory Days of Supply	Yes	Number

Item Attribute	Edit in ODS	Validation
Target Inventory Window	Yes	Number
Preposition Inventory	Yes	Yes or No
Repair LT	Yes	Number
Repair Yield	Yes	Number
Repair Program	Yes	<ul style="list-style-type: none"> <li>• Repair Return</li> <li>• Repair Return with Prepositioning</li> <li>• Advanced Exchange with Prepositioning</li> <li>• Advanced Exchange without Prepositioning</li> <li>• On purchase order approval</li> <li>• On defective receipt</li> </ul>
		Refer to Repair Program Influence on Service Supply Chain Lead Time Offset, page 6-5
Service Level	Yes	Number
Demand Fulfillment Lead Time	Yes	Number
Minimum Remaining Shelf Life (Days)	Yes	Number
Continuous Inter-Organization Transfers	Yes	
Convergent Supply Consumption	Yes	
Create Supply Flag	Yes	Yes or No
Divergent Supply Feed	Yes	

Item Attribute	Edit in ODS	Validation
Exception Set	Yes	LOV
Inventory Use Up Date	Yes	
Make/Buy	Yes	LOV (Make/Buy)
Margin	Yes	
Weight UOM	Yes	LOV UOM
Volume UOM	Yes	LOV UOM
Rounding Control	Yes	Yes or No
ATP Flag	Yes	Yes or No
ATP Components Flag	Yes	Yes or No
Vendor Managed: Minimum Quantity	Yes	
Vendor Managed: Minimum Days of Supply	Yes	
Vendor Managed: Maximum Quantity	Yes	
Vendor Managed: Maximum Days of Supply	Yes	
Vendor Managed: Fixed Quantity	Yes	
Vendor Managed: Consigned	Yes	
Retirement Rate	Yes	
History Intermittency	Yes	Default: No

## Special Source Instance Attributes for Service Parts Planning

Item attributes in the source instance for use in Service Parts Planning include repair yield, repair lead time, repair program, and preposition inventory. These attributes are

collected in planning and appear in the Item Attributes Mass Maintenance window. These attributes are available for query and updates as well.

## Destination-Only Item Attributes

Service Parts Planning capability requires a set of attributes that are maintained only in the destination instance. Because logical organizations (technician organizations) can support many zones, you might want to forecast by zone. You set up forecast rules for the zones where usage data is collected. Destination-only item attributes include Forecast Rule for Demand and Forecast Rule for Returns. These attributes appear in the item query result and are available as part of the mass maintenance capability.

Attribute	Description	Validation / LOV	Edit in ODS
Forecast Rule for Demand	This is the rule associated for forecasting demand for an item.	List of predefined forecast rules	Yes
Forecast Rule for Returns	This is the rule associated with forecasting the returns for an item.	List of predefined forecast rules	Yes
Life time buy date	The date for the lifetime buy	Date	Yes
End of life date	The date of the end of life for the spare part	Date > Life time buy date	Yes
Average demand beyond planning horizon	The average demand expected beyond planning horizon/period.	Number	Yes
Average returns beyond planning horizon	The average returns expected beyond planning horizon period.	Number	Yes
Return forecast time fence (Days)	The forecast time fence for return forecast	Number	Yes
Average Daily Demand	The average demand.	Number	Yes

Attribute	Description	Validation / LOV	Edit in ODS
Defective Item Cost	This reflects the cost of a defective part and will be used for cost based optimization plan and while computing Key Performance Indicators (KPI's).	Number	Yes
Basis for average daily demand	The stream that is used to calculate the average daily demand.	Valid collected stream.	Yes
Standard Deviation for daily demand	The standard deviation for daily demand.	Number	Yes
Mean inter arrival	The mean inter-arrival time	Number	Yes
Standard deviation of inter-arrival	The standard deviation of inter-arrival times	Number	Yes
Inter-arrival distribution method	The inter arrival distribution method will be used by IO as defined by the user in calculating the safety stock. If the value of this attribute is Null and the forecast method for the item is Croston's then inventory planning will assume this to be Poisson's distribution. For all other forecast methods, inventory planning will assume this to be normal distribution.	Varchar	Yes
Forecasting process/ engine	In the destination, this attribute signifies that the particular item-organization data collected will be used for SPP or Demantra.  This is a collected data only attribute that cannot be changed in a non empty collected simulation set and also sets one flag only for SPP versus Demantra.  If the simulation set is Null and pointing to the collected data, then users can edit it in the window or mass update it using the filters and attributes.	Varchar	

## Criticality Matrix

Analyzing the cause, frequency, and effects of a spare part's failure helps determine the importance of a given spare part to service operations. Service Parts Planning provides a framework of user-defined parameters that can be used to create flexible groups called *criticality categories*. These categories can be assigned to spare parts to create a *criticality matrix*.

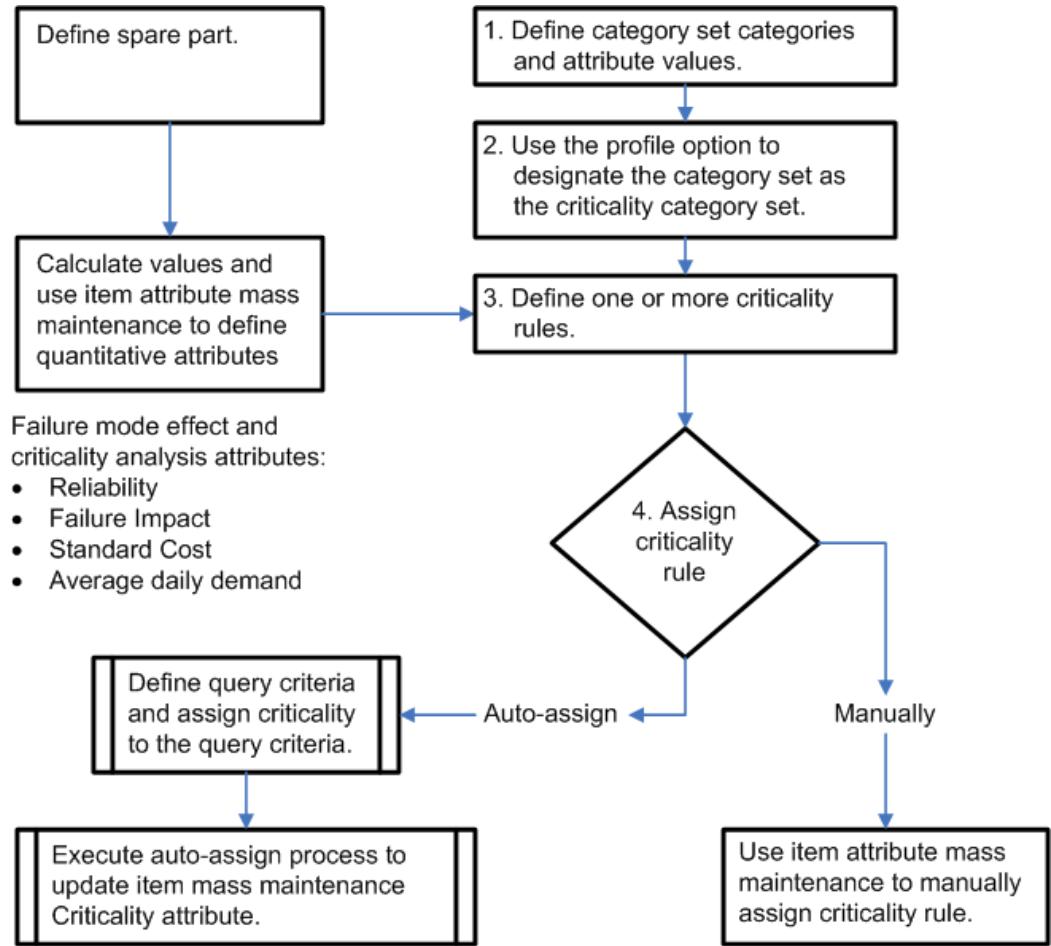
The criticality matrix helps set up planning policies for the spare part items. These policies include planning method, frequency of planning, forecast methods and rules, and service levels. The criticality matrix helps determine service levels and demand fulfillment lead times (DFLT) that impact quantity and location of the spare parts inventory.

A criticality matrix can be broadly defined as a function of:

- Item
- Location
- Standard Cost: The standard cost of the spare part
- Margin: (selling price – standard cost)
- Average daily demand
- Lead time: Typically the lead time to procure the part, either repair or new buy
- Reliability: Can be measured qualitatively or quantitatively, for example:
  - (qualitative) Reliability: high, medium, low
  - (quantitative) Failure frequency: mean time between failures (MTBF)
  - Repair frequency: mean time between repairs (MTBR)
  - Quantity of expected failures or repairs
  - Mean availability (or unavailability) over lifetime
  - Expected total uptime (or downtime) over lifetime
- Failure impact: Measures the impact that failure of a spare part has on a product. Example values include:
  - Cosmetic
  - Impaired

- Safety
- Inoperable
- Measure of deviation from forecast daily demand
  - Standard deviation
  - Coefficient of variation = Standard Deviation / Average Daily Demand
  - Mean absolute deviation (MAD)
  - Mean absolute percent error (MAPE)

The figure depicts a process flow for defining and using criticality:



1. Define the criticality category set and valid values for the category.

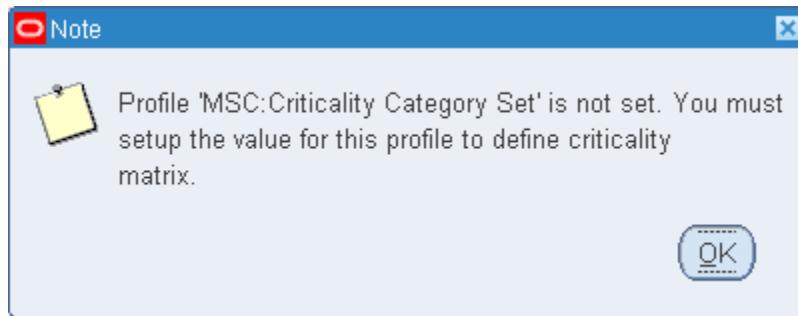
**Note:** No pre-seeded category set is named Criticality. You either define a new category set, or use an existing one as the category for defining criticality.

2. Specify the category set to be used for defining criticality in the profile option: MSC: Criticality Category Set.
3. Create criticality rules.
4. Assign criticality rules.
  - Manually, by using Item Attribute Mass Maintenance to manually assign a criticality rule to the criticality item attribute for selected items.
  - Automatically, by using the Criticality Matrix window to create and execute a query to assign the criticality rule to items that match the query.

## Setting the MSC:Criticality Category Set Profile Option

Implementation of the Criticality Matrix uses Category Set functionality. No seeded category set is named Criticality. You either designate an existing category set for use in defining the criticality matrix, or create a new category set for this purpose. You designate which category set you will use for setting up the Criticality Matrix in the profile option MSC: Criticality Category Set.

If you have not designated a criticality category set, when you navigate to the Criticality Matrix window, this note appears.



### To set the profile:

1. From the Service Supply Chain Planner responsibility, navigate to the Profile window.  
Other > Profile  
The Personal Profile Values window appears.
2. In the Profile Name column, inquire on Profile MSC:Criticality Category Set
3. Enter the name of the category set you want to designate for criticality functionality.
4. Click Save.

## Criticality Rules

Within the criticality category set, you can create and save multiple criticality rule names. You do this on the Criticality Matrix window. For each criticality rule, you setup a sequence of criticality categories and query criteria corresponding to each category.

### Example

For example, the criticality category called Durable is set up with the following query:

- Item Attribute: Standard Cost

- Condition: At Least
- Value: 500

And

- Item Attribute: Reliability
- Condition: Equals
- Value: High

The criticality category called Disposable is set up with the following query:

- Item Attribute: Selling Price
- Condition: less than
- Value: 50

## Criticality Rule Assignment

There are two ways to assign Criticality Rules:

- Manually
- Automatically

## Manual Assignment of Criticality Rule

Item-organization attribute mass maintenance has an attribute named *Criticality*. The validation for this field is a valid list of values from the category set pointed to by profile option MSC: Criticality Category Set.

While defining criticality, you can use the following updateable item-organization attributes filter criteria:

- Cost (Standard cost)
- Margin
- Average daily demand
- Lead times (various lead time types)

Attributes in the Item Attributes Mass Maintenance window that you may find useful when setting the criticality of a group of items include:

- Reliability

- Failure Impact
- Standard Deviation
- Coefficient of Variation = Standard Deviation / Average daily demand

Additionally, the Item Mass Maintenance window has user-defined attributes (User Attribute 1 through User Attribute 15) in the item-organization mass maintenance entity. You can specify any values, and then use these when setting criticality, or in general when performing item attribute mass maintenance. These attributes are also available as part of the Find criteria in the Item Attributes Mass Maintenance window.

#### ***Updateable Attributes***

<b>Attribute</b>	<b>Description</b>	<b>Validation LOV</b>	<b>Edit in ODS</b>
Criticality	The definition of the severity of impact (or criticality) of a spare part on the install base end product.	Valid Categories in Criticality Category Set	Yes
Reliability	Reliability is an indication of the consistency of scores over time.	Varchar (None)	Yes
Failure Impact	The impact or effect of failure.	Varchar (None)	Yes
Standard deviation	The standard deviation is calculated by the concurrent program 'Calculate average daily demand'.	Number	Yes
Coefficient of Variation (CV)	The coefficient of variation is calculated by the concurrent program 'Calculate average daily demand'.	Number	Yes
User Attribute 1 through 15	User defined attributes	None	Yes
Basis for average daily demand	The data stream that is used to calculate the average daily demand.	Valid collected stream. You cannot update the related attributes (Accuracy measure, Coefficient of Variation, and Average daily demand) until you specify the basis.	Yes

## Automated Assignment of Criticality Rule

You auto-assign criticality by executing query criteria that include attribute ranges for the dimensions of the criticality matrix, such as those listed previously (cost, reliability, failure impact, standard deviation, and so on), and any other item attributes that are part of the item simulation set. If needed, you can also employ User Attribute 1 through User Attribute 15.

Executing the query causes the criticality rule to be assigned to items matching the query criteria. When you execute the criticality criteria, the criticality category is assigned to the item and appears in the Item Attributes Mass Maintenance window as the Criticality attribute.

- When the auto-assign process is re-run, manual updates are overwritten.
- In case the auto-assign process has multiple rules or conditions that involve the same item, the process continues to override the previous category until all the queries are exhausted. The last updated category is retained as the Criticality category.

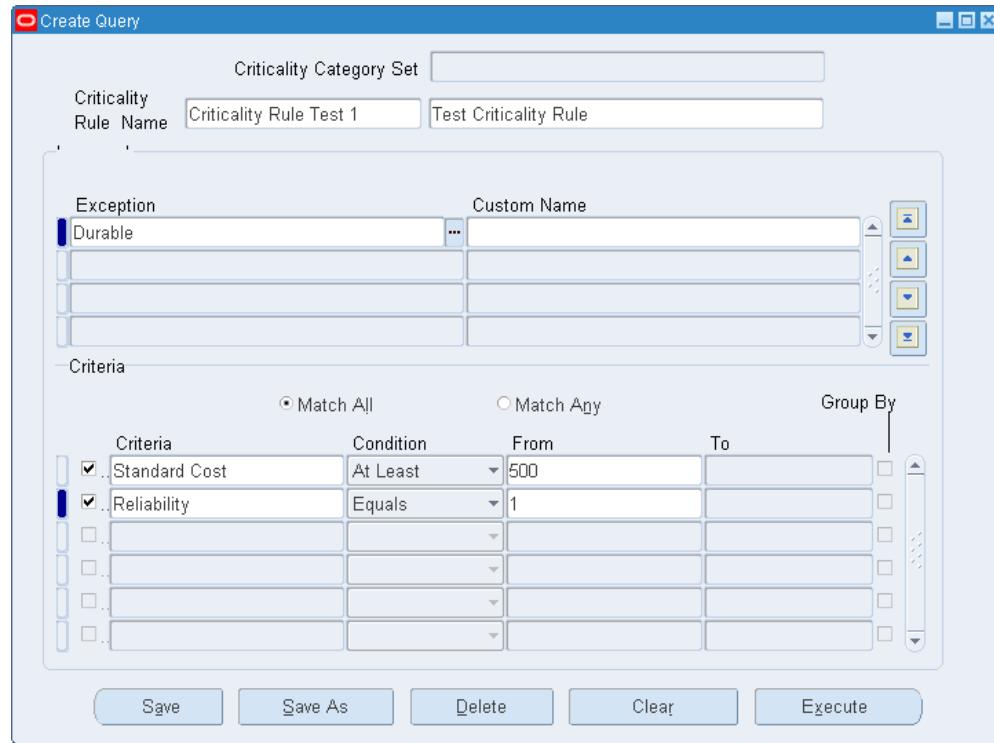
## Differences Between Criticality Category and Item Categories

In Item Attributes Mass Maintenance, Category is not an updateable item attribute, whereas Criticality is an updateable attribute. Item categories do not change across item simulation sets, but the definition of Criticality can change.

## Creating and Executing a Criticality Query

1. From the Service Supply Chain Planner responsibility, navigate to the Create Query window.

Setup > Manage Criticality matrix



2. Specify the criticality rule name and description.
  - Criticality Assignment Set: This display only field shows the category set defined in the profile option MSC: Criticality Category Set.
  - Criticality Rule Name (and Description) – You can create and save different criticality rule names.
3. In the Criteria region, specify one or more criteria.
  - Criteria: The Criteria LOV includes all the attributes available in Item Attributes Mass Maintenance.
  - Condition: The Condition operator works with the From and To ranges. You select the Condition operator from the list of values.
  - From and To: Enter values for evaluating the criteria row.
4. To save the criticality rule without executing it, click Save.
5. To save the criticality rule against a different name, click Save As.
6. To erase the highlighted exception, click Delete.

7. To erase the selected criteria row, click Clear.
8. To auto-assign the criticality category to the items matching the query criteria, click Execute. You can view the output in the Item Attributes Mass Maintenance Criticality attribute.



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## Working with Plans

This chapter covers the following topics:

- Service Parts Planner's Worksheet
- Supply/Demand Analysis Worksheet
- Creating Comments
- Plan Actions (Exception Region)
- List of Exceptions in SPP
- Replan Options Window
- Plan Summary Dashboard
- Actions Summary Window
- Creating Planner's Work Lists
- Windows Available from the Worksheet Tools Menu
- Defining User Groups
- Executing a Planner Work List
- Viewing Planner Work List Results
- User Preferences Window - Main Tab
- User Preferences - Plan Summary Tab
- Pegging in SPP
- Queries

### Service Parts Planner's Worksheet

The Planner's Worksheet provides the Supply and Demand Analysis and Forecast Analysis information used for decision making. This chapter describes how to use Planner's Worksheet user interface elements while performing analysis of the plan,

performing incremental planning, analyzing supply chain details, analyzing and correcting exceptions in the plan, and executing action messages.

## Worksheet Menu and Toolbar

This section describes the menu and toolbar icons that planners can access at any time from the Planner's Worksheet. The following menu items appearing above the toolbar are the same as in ASCP/DRP. For more information about these menu items, see General Navigation in the Planner Workbench chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

- File
- Edit
- View
- Folder
- Window
- Help

The following menu items include options that are unique to Service Parts Planning:

- Tools – Provides access to the following windows:
  - Exception Summary
  - Exception Details
  - Supply and Demand Analysis
  - Order Details
  - Personal Query
  - Planner's Work List
  - User Preferences
  - Notifications
  - Organization Lists
  - Zone Lists
  - Customer/Technician Lists

- Work Dates
- Close All Detail Windows
- Plan
  - Replan Item
  - Save Exceptions Version
  - Plan Summary
  - Plan Names
  - Plan Options
- Actions
  - Select All for Release
  - Release
  - Firm All

## Service Parts Planning Main Toolbar Action Icons:

Click the icon to open the corresponding window.

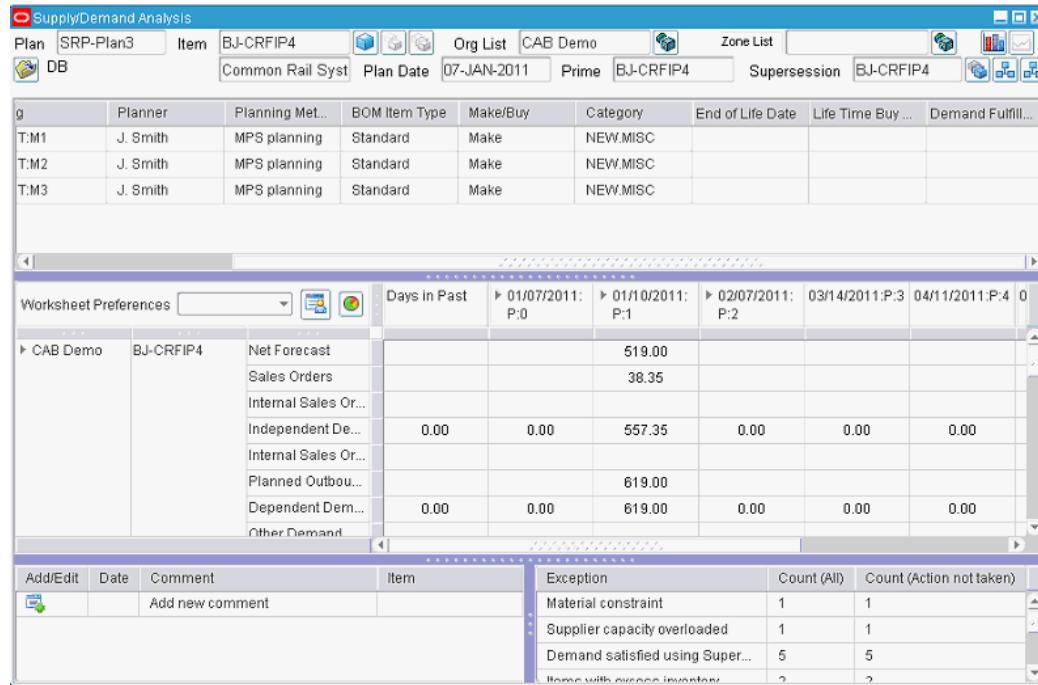
**Note:** When a particular window is already open, the button related to that screen on the main toolbar is disabled, or grayed out. For example, when the planner is already on the supply and demand analysis screen, the demand and supply analysis screen button appears in gray tones.

- Supply Demand Analysis, page 9-4 (includes the Planner's worksheet)
- Plan Actions Exception Summary, page 9-32
- Queries, page 9-65
- Create Planner's Work List, page 9-44
- Choose Plan
- Replan Item (Replan Options Window), page 9-37
- Plan Summary Dashboard, page 9-38

- User Preferences Plan Summary, page 9-62
- Online Help

## Supply/Demand Analysis Worksheet

To open the Supply Demand Analysis worksheet, from Service Parts Planning > Workbench, click the Supply Demand icon, or navigate from the Menu > Tools > Supply and Demand Analysis.



The Plan Analysis worksheet is populated with information about the selected plan at the (Item, Prime, or Supersession) aggregation level and in the (Org List or Zone List) context. The default level and context values are set in User Preferences. You can change the view by selecting different aggregation levels and contexts in the header region.

You can resize the regions of the Supply and Demand Analysis window by dragging the region boundaries.

### Item – Org Selector (Header) Region



The item-org selector region includes (top first row, left to right) :

- Plan: This read-only field displays the name of the selected plan.
- Item: Optionally enter an item identification, or select an item from the list of values.
- Aggregation level icons: Item, Prime, Supersession
- Org List: If an item is selected, then an organization must be entered. The default Org List value is set in User Preferences.
- Open Org List (icon): Opens the Organizations List window for creating or modifying Org lists.
- Zone List: Org List and Zone List act as toggles to switch contexts.  
See Supported Contexts, page 9-6
- Open Zone List (icon): Opens the Zones List window for creating or modifying zone lists.
- Supply and Demand Analysis (icon): This icon places supply and demand information in the Supply and Demand View pivot table.
- Forecast Analysis (icon): This icon places forecast information in the Forecast View pivot table.

Second row (left to right):

- Folder: Folder functionality for the Item / Location region
- (Unlabeled field): When an Item is selected, this read-only field displays the description of the selected item.
- Plan Date: Time stamp for the last time this plan was run
- Prime Item: Read only field, derived by the planning engine
- Supersession Item: Read only field, derived by the planning engine
- Supersession (icon): Opens the Supersession window
- Failure Rate (icon): Opens the Failure Rate window for maintaining failure and return rates.
- Parts Usage (icon) – Opens the Parts Usage window for viewing information about where a part has been used. This displays the product and organization that this part goes into. This is derived from the item relationship service parts. information

## Supported Item Aggregation Levels

You can view the Planner's Worksheet using one of three item aggregation levels: Item, Prime or Supersession. The prime item and the supersession item are derived by the planning engine.

## Prime Item and Supersession Item Concepts

For a given supersession chain, the *supersession item* is defined as the latest item in the supersession chain. The *prime item* is defined as the highest *bilateral revision* part number in the chain, or the item itself in case it does not have a bilateral segment.

### Example

For example:

A -> A1 -> A2 -> A3 <- -> A4 -> A5 <- -> A6 <- -> A7 <- -> A8

- For item A, the prime item is A, and the supersession item is A8.
- For item A1, the prime item is A1, and the supersession item is A8.
- For item A2, the prime item is A2, and the supersession item is A8.
- For item A3, the prime item is A4 (which includes A3 and A4) and the supersession item is A8.
- For item A4, the prime item is A4, and the supersession item is A8.
- For item A5, the prime is A8 (which includes A5, A6, A7 and A8) and the supersession item is A8.

## Supported Contexts

Independent controls for organization and zone drill-down are provided. The Organization drill down can be done at any node of the zone. Relevant organizations belonging to the expanded zone node appear.

The two seeded zone nodes are Global and Local. The Global node represents the item level of the global product population forecast. It is not zone-specific. On expanding the global node, the organization to which the global forecast was distributed appears. The Local node represents local forecasts. On expanding the local node, the organizations for which local forecasts exist appear.

### Org List

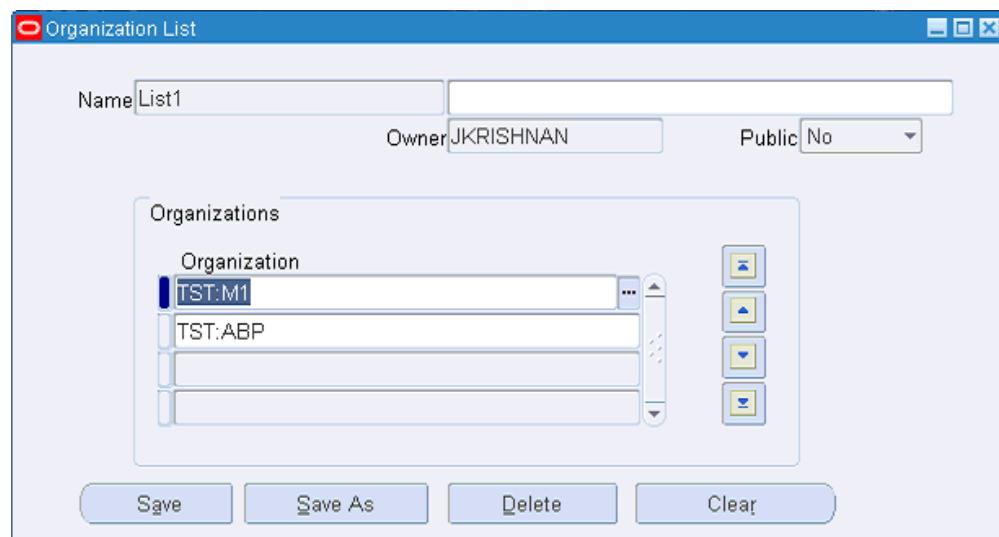
The Org List includes one or more organizations and groups of organizations. The list of values lists the individual organizations in the plan, the user defined groups of organizations, and an entry representing all organizations in the plan.

For example, the Org List LOV includes:

- Central warehouse
- Seattle warehouse
- Toronto warehouse
- European warehouse
- Main warehouse (includes Central and European warehouses)
- Americas (includes Seattle and Toronto warehouses)
- All orgs

To access the Organization List selection window, click the Create icon that is located in one of the following places

- On User Preferences, beside the field that displays the default organization list
- On Supply and Demand Analysis, next to the Org List
- Navigate from the Menu bar > Tools > Organization Lists



You can define and save multiple named organization selection lists. To set the sequence of organizations that appear within a list, select an organization from the list of organizations, and then use the arrows to move that organization up or down in the displayed sequence. Continue this process until the sequence is as desired. Click Save.

The Public Yes / No field determines whether the named list is accessible to other planners. If made public (Yes), the Org List is accessible to other planners from the Horizontal Plan right-click menu. The Public list of values includes only: Yes and No. The default value is No.

The seeded Org List entry named All Org" enables view across all the organizations, and cannot be deleted.

### **Zone List**

To access the Zone List selection window, perform one of the following actions:

- On User Preferences, click the Create icon located beside the field that displays the default Zones List
- On Supply and Demand Analysis, click the Create icon located next to the Zones List
- Navigate from the Menu bar > Tools > Zone List

The look and feel of the Zone List window is similar to the Organization List window.

You can define and save multiple named zone selection lists.

#### **To set the sequence of zones that appear within a list:**

1. Select a zone from the list of zones
2. Use the arrows to move that zone up or down in the displayed sequence.
3. Continue this process until the sequence is as desired.
4. Click Save.

The Public Yes / No field determines whether the named list is accessible to other planners. If made public (Yes), the Zone List is accessible to other planners from the Horizontal Plan right-click menu. The Public list of values includes only: 'Yes' and No. The default value is No.

The seeded Zone List entry named All Zones enables view across all the zones, and can not be deleted. Thus, the drill-down of the zones starts with All Zones and then drills down into individual zones.

### **Org List / Zone List Context Toggle**

Clicking the Org List causes the Zone List to be disabled, or grayed out. The context is organizations. By clicking the Zone List, the context changes to zone and the Org List is grayed out. Essentially the Org List and Zone List act like toggle buttons.

## **Supersession Chain Window**

The Supersession window is view-only. You can not implement any changes here. The following figure depicts the Supersession and Repair to item relationships for an item in supply and demand analysis context.

**Supersession Chain**

Supersession

Item	BJ-CRFIP4	Description	Common Rail System			
Replaced Item	Superseding Item	Repair-to Item	Reciprocal	Effective Date	Disable Date	
BJ-CAMFIP1	BJ-DISCFIP2	BJ-EDCFIP3	Unilateral	07-JAN-11		
BJ-DISCFIP2	BJ-EDCFIP3		Bilateral	07-JAN-11		
BJ-EDCFIP3	BJ-CRFIP4	BJ-CRFIP4	Unilateral	07-JAN-11		

Supersession
Repair-to

**Note:** The Repair to Item relationship appears along with the Supersession Item relationship. In this example, BJ-CAMFIP1 is superseded by BJ-DISCFIP2 and BJ-DISCFIP2 is superseded by BJ-EDCFIP3. BJ-CAMFIP1 can be repaired to BJ-EDCFIP3.

## Item/Location Details Region

Selecting an item and organization overrides selections made using the selector for the Product and Organization dimensions.

g	Planner	Planning Met...	BOM Item Type	Make/Buy	Category	End of Life Date	Life Time Buy ...	Demand Fulfill...
T:M1	J. Smith	MPS planning	Standard	Make	NEW.MISC			
T:M2	J. Smith	MPS planning	Standard	Make	NEW.MISC			
T:M3	J. Smith	MPS planning	Standard	Make	NEW.MISC			

The Item/Location details region includes:

- Folder: The Item / Location region provides folder-based functionality. You can select a list of attributes for an item to be displayed as columns in the Item / Locations region.
- Item attributes for Forecast Rule and Lifetime Buy.

- The forecast accuracy metric.
- Sourcing details for the supply chain at the selected location.

The sourcing rule options are Transfer, New buy, and Repair. The primary sources are displayed. Sourcing depends on the assignment set selected for the plan. For example, selecting an organization grouping displays details for the organization name that equals the group name. Because folder functionality is present in this region, you can add or remove available details.

**Note:** Repair lead time in the item location details is the total repair lead time. This includes time to transfer defectives in and usable parts out of the repair organization plus the actual time to repair it.

- Separate rows (based on the item aggregation level) for all the valid combinations of items and organizations.

For example, if the Org List has 10 organizations, and the Prime has 2 parts, and both parts are valid for all ten organizations, then 20 item-organization related rows appear.

## Right-Click Actions Supported in the Item / Location region

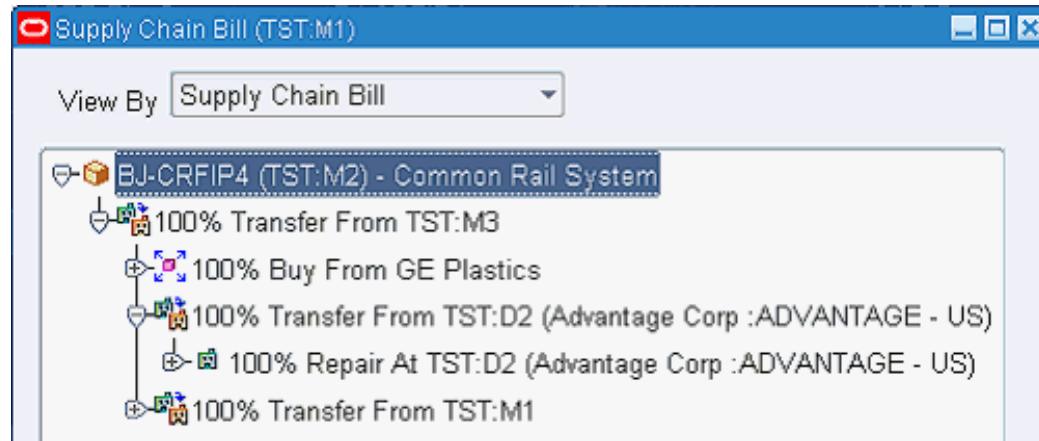
On the Item / Location region, you can right click each valid item-organization combination to view:

- Order details for the item-organization
- Forecast rule assigned to this item-organization
- Calendar
- Forecast rule for returns
- Failure rates
- Supply chain details:
  - Sources
  - Supply chain bill for the item-organization
  - Destination

## Supply Chain Details

From the right-click menu, you can select Supply Chain, and then open the sources,

destination, or supply chain bill for the item-organization. For each action, the appropriate window opens with the item-organization context.



## Circular Sourcing in the Supply Chain Bill

In case of circular sourcing, the user interface breaks the supply chain bill after displaying the circular source. An icon in the supply chain bill indicates circular sources. Another icon represents the Repair at relationship. Further, the transfer of the defectives is shown using the transfer icon, but in red color. This helps distinguish between the forward supply chain (movement of usable parts) and the reverse supply chain (movement of defectives).

**Note:** The transfer rule that is related to repair actually shows the repair supplier organization.

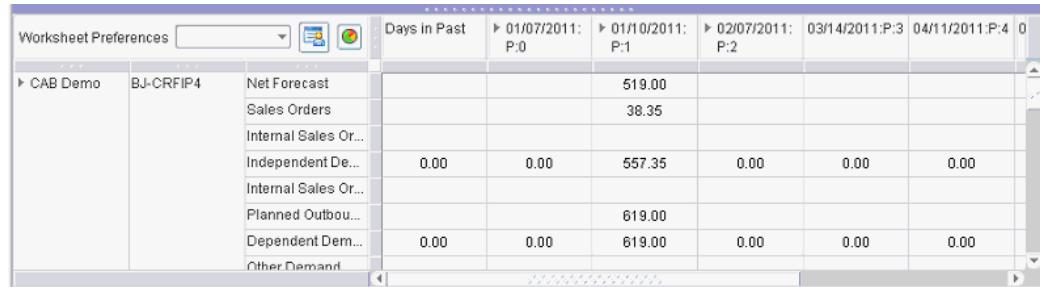
## Right-Click Actions on Supply Chain Bill

On the supply chain bill, you can click any node of the supply chain, right-click to open the Properties window, and then expand the node.

- The Supply and Demand Analysis window is available in all nodes except the master node.
- Supplier capacity is available only when in context to a supplier.
- Properties window is same as the one for ASCP. For more information about the Properties window, see "Properties Window" in the "Planner Workbench" chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

The defective part appears as a component. The supply chain bill traverses the supply chain for the defective part supply.

## Worksheet Analysis Region



The screenshot shows the 'Worksheet Preferences' dialog box. At the top, there are buttons for 'Worksheet Preferences' and 'Analysis Rows'. Below these are icons for 'Forecast Analysis' (blue square with a white circle), 'Demand and Supply' (green square with a white circle), and 'Worksheet Preference Details' (yellow square with a white circle). The main area is titled 'Analysis Rows' and contains a table with the following data:

Days in Past	01/07/2011: P:0		01/10/2011: P:1		02/07/2011: P:2		03/14/2011: P:3		04/11/2011: P:4	
	Net Forecast	Sales Orders	Internal Sales Or...	Independent De...	Internal Sales Or...	Planned Outbou...	Dependent Dem...	Other Demand		
Net Forecast				519.00						
Sales Orders				38.35						
Internal Sales Or...										
Independent De...	0.00	0.00	557.35		0.00	0.00	0.00			
Internal Sales Or...										
Planned Outbou...			619.00							
Dependent Dem...	0.00	0.00	619.00		0.00	0.00	0.00			
Other Demand										

### Worksheet Preferences – Selecting Available Views

On the Item-Organization selector region, you can select either the Org List or the Zone List context. You use the icons located at the top right to toggle between the Forecast Analysis view and the Demand and Supply view.

- If you select Org List, then you can select either the Forecast Analysis view or the Supply and Demand view. The default view is determined by User Preferences.
- If you select Zone List, then only the Forecast Analysis view is available, and the Supply and Demand view toggle button is disabled, or grayed out.
- Worksheet Preferences: You can select from the LOV to switch between named worksheet preferences.
- Worksheet Preference Details (icon): Opens the form where you can create named sets of worksheet preferences.
- Analysis Rows: Displayed rows are determined by Worksheet Preferences. See Saving Worksheet Preferences to Show and Hide Row Names, page 9-25.
- Graph (icon): Select the graph icon to plot graphs of selected rows.
- Time Dimension
  - In the Supply and Demand view, the bucket size is specified by the Plan Option for Demand and Supply Analysis.
  - In the Forecast Analysis view, separate regions show bucketed views of forecast and history. Bucket size is as specified by the Forecast rule.
  - See Time Buckets on the Supply/Demand Worksheet, page 9-25.

## Color Banding

The totals and subtotals appear in bold font with a beige color band. The total and

subtotal rows are:

- Total forecast
- Independent demand
- Dependent demand
- Total demand
- Total supply
- Returns forecast
- Total defective part demand
- Total defective part supply.

## Row Names in Supply/Demand Analysis

The following table lists all row types available in the service supply chain. The indented row column shows the first level to which the row opens when you double-click the row name.

Row Name	Indented Row	Description	Click to Open Order Details Form
Net Forecast		This is the forecast used by the replenishment plan and includes the forecast after consumption and demand time fence (if enabled).	Yes
Sales Orders		The open sales order in the supply chain.	Yes
Internal Sales Orders – Field Organizations		The open ISOs (outbound shipments from field organizations). The collected ISO customer name field displays the technician name.	Yes
Independent Demand		Internal sales order – field orgs + sales orders + net forecast	Yes

Row Name	Indented Row	Description	Click to Open Order Details Form
Internal Sales Order	Destination	The ISO that represents the transfer material to be shipped out	Yes
Planned Order Demand	Destination	The planned order demand that will be converted to ISO (outbound shipments).	Yes
Dependent Demand			No
Other Demand		From the master demand schedule (MDS), master production schedule (MPS), and so on	No
Total Demand		Independent demand + dependent demand + other demand	No
Beginning On-hand		The current usable on-hand inventory	Yes
In-Transit	Source of supply	The in-transit material	Yes
<b>Note:</b> Collected in-transit ignores the related inbound shipment.			
In-Receiving	Source of supply		Yes
New Buy Purchase Order	Source of supply		Yes
New Buy Purchase Requisitions	Source of supply		Yes
Internal Repair Order	Source of supply	Transfer in from depot	Yes
External Repair Order	Source of supply	Purchase order to repair supplier	Yes
Inbound shipment	Source of supply	Does not include internal repair	Yes

Row Name	Indented Row	Description	Click to Open Order Details Form
Repair Work Order			Yes
Planned New Buy Order	Source of supply		Yes
Planned Internal Repair Order	Source of supply		Yes
Planned External Repair Order	Source of supply		Yes
Planned Transfer Order	Source of supply	Transfer of supply from one org to the other. Planned Transfer, as distinguished from Planned External Repair Order and Planned New Buy Order.	Yes
Planned Repair Work Order			Yes
Planned Warranty order			
Total Supply			
Safety Stock (Days of Supply)			
Total unconstrained demand			No
Projected Service Level			No
Target Service Level			
Maximum Level			
Projected Available Balance		Cumulative (total demand – total supply)	No

Row Name	Indented Row	Description	Click to Open Order Details Form
Projected On Hand		Cumulative (total demand – current supply)	
Defective Outbound shipment	Destination		Yes
Planned Defective outbound shipment	Destination		Yes
Defective Part demand		Defective part demand for repair order and planned repair order	Yes
Total Defective Part demand			
Defective On-Hand	On-hand by condition (warranty and defective)		Yes
Returns		The adjusted returns forecast used by supply plan. This includes offset by global forecast and the remaining forecast after the Returns Forecast Time fence has been enabled. (Analogous to net forecast for the demand)	
Defective Inbound shipment	Source of supply		Yes
Planned defective Inbound shipment	Source of supply		No
Defectives in transit		The in-transit supply, if the defectives are moving from one organization to another	Yes
Defectives in receiving			Yes

Row Name	Indented Row	Description	Click to Open Order Details Form
Total Defective Supply			
Projected Available Balance (Defective)		Cumulative (defective part demand – defective supply)	No

## Forecast Analysis View

In the forecast analysis view, separate regions show bucketed views of forecast and history. Bucket size is as specified by the forecast rule.

Worksheet Preferences			Days in Past	01/07/2011: P:0	01/10/2011: P:1	02/07/2011: P:2	03/14/2011:P:3	04/11/2011:P:4
► All Regions	► All Orgs	BJ-EDCFIP3	Total Forecast	0.00	0.00	0.00	0.00	0.00
			Original For...	0.00	0.00	0.00	0.00	0.00
			Consumed	0.00	0.00	0.00	0.00	0.00
			Net Forecast	0.00	0.00	0.00	0.00	0.00
			Overconsu...	0.00	0.00	0.00	0.00	0.00
			Manual Over...	0.00	0.00	0.00	0.00	0.00
			02/01/2009:D:0	03/01/2009:D:1	04/01/2009:D:2	05/01/2009:D:3	06/01/2009:D:4	07/01/2009:D:5
► All Regions	► All Orgs	BJ-EDCFIP3	Demand His...	0.00	0.00	0.00	0.00	0.00
			Returns His...	0.00	0.00	0.00	0.00	0.00

### Zone to Organization Drill-Down

When analyzing a zone level forecast, you can drill down from the zone to the organizations to which the forecast has been allocated, based on global forecasting rules.

### Organization to Zone Drill-Down

Similarly, when you are on an organization list that has received a zone level forecast, then you can verify the forecast numbers at the zone level.

### Supersession Drill-Down

When the Forecast Analysis view opens for a prime or supersession chain, the display is aggregated at the Prime or Supersession level. You can drill down from this to view the forecasts for individual revisions of the item.

### Display Range for the History Block

Set in User Preferences, by default the display range is set to (sysdate – 2 years). If calendar type is Manufacturing, then the historical data displays in periods. If the

calendar type is Gregorian, then historical data appears in months.

**Row Names in Forecast Analysis**

Row Name	Description	Remark	Edits allowed
Total Forecast	This is the forecast used by supply chain after consumption and forecast allocation in case of global forecast		
Original Forecast	Original forecast quantity		
Consumed	Quantity of forecasts that has been consumed by sales orders		
Net Forecast	Remaining unconsumed forecasts		Through Order Details form
Over Consumption	Excess consumption of forecasts		
Manual Override	Manually entered forecast value	Populated in case manual entry of data. Overrides all other forecast values	Through Order Details form
Demand Schedule	Forecast entered as a demand schedule from source ERP		Through Order Details screen
Part History based Forecast	Displays the Usage/Shipment/Returns history-based forecast	Because only one of the three can be used, one single row appears.	
Population based Forecast	Display the product population-based forecast value	If product population-based forecasting is enabled for the item	

Row Name	Description	Remark	Edits allowed
Total Returns Forecast	Total returns forecast		
Returns – Net Forecast	Unconsumed returns forecast		Through Order Details form
Returns Manual Forecast	Manual entry value of returns forecast	Populated incase of manual entry. Overrides all other forecast values.	Through Order Details form
Returns Demand Schedule	Demand schedule for returns from source ERP		
Returns – Part History based Forecast	Displays the Usage/Shipment>Returns history based returns forecast	Because only one of the three can be used, one single row appears.	
Returns – Population based Forecast	Display the Product Population based returns forecast value	If product population-based forecasting is enabled for the item	

- In case multiple forecasting bases are selected, the values are supplied in appropriate rows. In this case, the Original forecast quantity is the sum of the forecasts generated.
- Net forecast is the Original forecast minus the consumed forecast.
- Overridden forecast values appear in the Manual Override column.
- The total forecast is equal to the net forecast, unless a manual override exists. In that case, the total forecast is equal to the manual Override.
- In case of a demand schedule from Oracle Demantra, that value is shown under the Demand Schedule column.

- Because only one of Usage / Shipment / Returns-based forecasting can be employed, the Part History based Forecast row displays the value if any one of these are employed.
- Similarly, the Populated Based Forecast row shows the value if product population-based forecast is enabled.
- Interpretation of the rows for Returns forecast is similar to the interpretation of the corresponding Demand rows.
- In case of a global forecast, the portion of the forecast distributed to the organization appears under the appropriate column when the All Orgs drill-down is opened to the appropriate organization.
- When you are drilling down from All Zones, in addition to the nodes for individual zones, Global and Local nodes are available. These show global forecast not belonging to any zone, and local forecasts not belonging to any organization, respectively.
- Refer to Levels of Output for more details.

***Forecast Analysis View row calculations:***

---

Total Forecast	If (ManualOverride=NULL, NetForecast, ManualOverride)
Original Forecast	DemandSchedule+HistoryBasedForecast+PopulationBasedForecast
Consumed	Consumed Forecast
Net Forecast	Original Forecast - Consumed
Over Consumption	If (Consumed>OriginalForecast, Consumed-OriginalForecast, 0)
Manual Override	User Entered Forecast Value
Demand Schedule	Forecast coming in as a Demand Schedule
Part History based Forecast	Usage / Shipment / Returns based forecast

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Population based Forecast	Product Population Based Forecast
Total Returns Forecast	If (ReturnsManualForecast=NULL, Returns-NetForecast, ReturnsManualForecast)
Returns – Net Forecast	Original Returns Forecast – Consumed Returns Forecast
Returns Manual Forecast	User Entered Returns Forecast Value
Returns Demand Schedule	Returns Forecast coming in as a Demand Schedule
Returns – Part History based Forecast	Usage / Shipment / Returns based Returns Forecast
Returns – Population based Forecast	Product Population Based Returns Forecast

---

## Manual Override

You can manually override values in the forecast and demand schedule rows. For example:

---

	Bucket 1	Bucket 2	Bucket 3
Forecast	20	20	30
Manual Override	45	--	30
Demand Schedule	10	10	8
<b>Total Forecast</b>	<b>45</b>	<b>30</b>	<b>30</b>

---

Bucket 1: Total forecast is 45 where 45 overrides the statistical forecast (20) and demand schedule (10).

Bucket 2: Total forecast is 30 units, which is the sum of statistical forecast (20) and the demand schedule (10).

Bucket 3: Total Forecast will be 30 where 30 overrides the statistical forecast (30) and demand schedule (8).

- Manual override is allowed only in the leaf node, in other words, where the forecast is actually generated, and not necessarily viewed. For example, when you are viewing the All orgs information, manual override is not allowed.
- Further, manual override is permitted at the forecasting bucket level only. For example, if the user has forecasted at the weekly level, but is viewing the forecast in the monthly level, then override is not permitted. To edit the weekly forecast quantity, either go to the Order Details form, or go to the date of a forecast.
- The demand schedule entry can also be updated for both date and quantity. This change is only temporary. Publishing a new scenario from the demand planning erases these changes.

## Deleting Entries in the Manual Override Row

Planners can multi-select records to delete by selecting the records and then clicking the toolbar Delete button, or from the menu, select Edit > Delete. Additionally, planners can select the entire row by clicking the manual override row type, and then clicking the toolbar Delete button.

If selected cells are non-editable, then a warning appears in the bottom bar: *This is not an editable value.* Editing capability is provided only when the displayed bucket size is equal to the planning or forecasting bucket size.

## Time Bucket Size for Forecast Analysis Worksheets

The forecast analysis worksheet derives its bucketing scheme from the forecast rules. A forecast rule is associated with each item. Planning uses the forecast rule associated with the latest revision item to determine the time bucket size for forecasting. The forecast analysis screen derives the bucket size from the forecast bucket size specified here.

**Note:** In case of a global forecast and the zone-to-organization or organization-to-zone drill down, the forecast bucket being used is based on the forecast rule. This is true even when the organization-specific forecast is spread; the user interface rolls up the organization forecast to the bucket specified by the global forecast.

### **Example**

For example:

- The forecast bucket is periods, while the planning bucket is in weeks.
- The forecast for zone R1 that is supported by warehouse RW1 is 100 units per period.
- Because the planning buckets are in weeks, planning spreads the global forecast of 100 into the number of weeks in the period (for example 4), resulting in 25 units per week at RW1. In the forecast analysis for zone R1, the forecast for R1 is 100 units and the indented row shows the org RW1 with a forecast of 100 units.

In the forecast analysis for zone R1, the forecast for R1 is 100 units and the indented row shows the org RW1 with a forecast of 100 units.

Zone	Indented	Item	Order Type	Total	Jan-05	Feb-05	Mar-05
Zone 1		Item A8	Total Forecast	10000	100	100	100

The indented row shows zone-to-org forecast spread

Zone	Indented	Item	Order Type	Total	Jan-05	Feb-05	Mar-05
Zone 1		Item A8	Total Forecast	1000	100	100	100
	RW1	Item A8	Total Forecast	1000	100	100	100

The demand schedule could have a different bucketing policy or calendar as defined in the demand plan. The user interface takes the raw numbers and displays them based on the inline forecast bucket size. When the demand planning buckets are smaller than the inline forecast buckets, the user interface displays buckets according to inline forecasting. This gives the impression that the user interface is aggregating the forecast quantities.

### **Example**

For example:

- Bucket for inline forecasting = weeks
- Bucket for demand schedule entries = days

For the item-org, week is defined as day 1 though day 5. Then all forecast entries from the demand schedule that have day 1 to day 5 appear in the first bucket.

In case the Demand Planning scenario buckets are larger than inline forecast, the user interface places the entire quantity according to the date in the scenario and does not disaggregate the numbers.

#### **Example**

For example,

- Bucket for inline forecasting = weeks
- Bucket for demand schedule entries = months

For the item-org, the first four weeks the entire demand schedule entry is placed on one of the weeks (for example, the 1st week) where forecast from demand schedule falls.

In case no inline forecast exists, the bucketing is based on periods defined by the organization that is being viewed.

## **Time Buckets on the Supply and Demand Worksheet**

The worksheet enables you to view the time buckets at a different level of aggregation from the aggregate level defined for the plan. Users can drill down to the granular information, and then save the Worksheet Preferences with the preferred bucketing and cell width.

**Note:** The generated forecast that is part of the total forecast always appears at the forecasting bucket level.

The supplies and demands in daily time buckets are time stamped at the end of the shift calendar that is being used. In the case of a 24 x 7 calendar, the time stamp is shown as 23:59. Note that netting and pegging occurs at the day level. Hence you can put the time stamps at the end of the shift or day.

## **Saving Worksheet Preferences to Show and Hide Row Names**

By default, the worksheet opens with a compact view of the data such that you do not need to change the worksheet column width or row height. You can create, edit, and view worksheet preferences. To do this, click the Worksheet Preferences Details icon located next to the Worksheet Preferences LOV field. This action opens the User Preference window.

The User Preferences window enables you to:

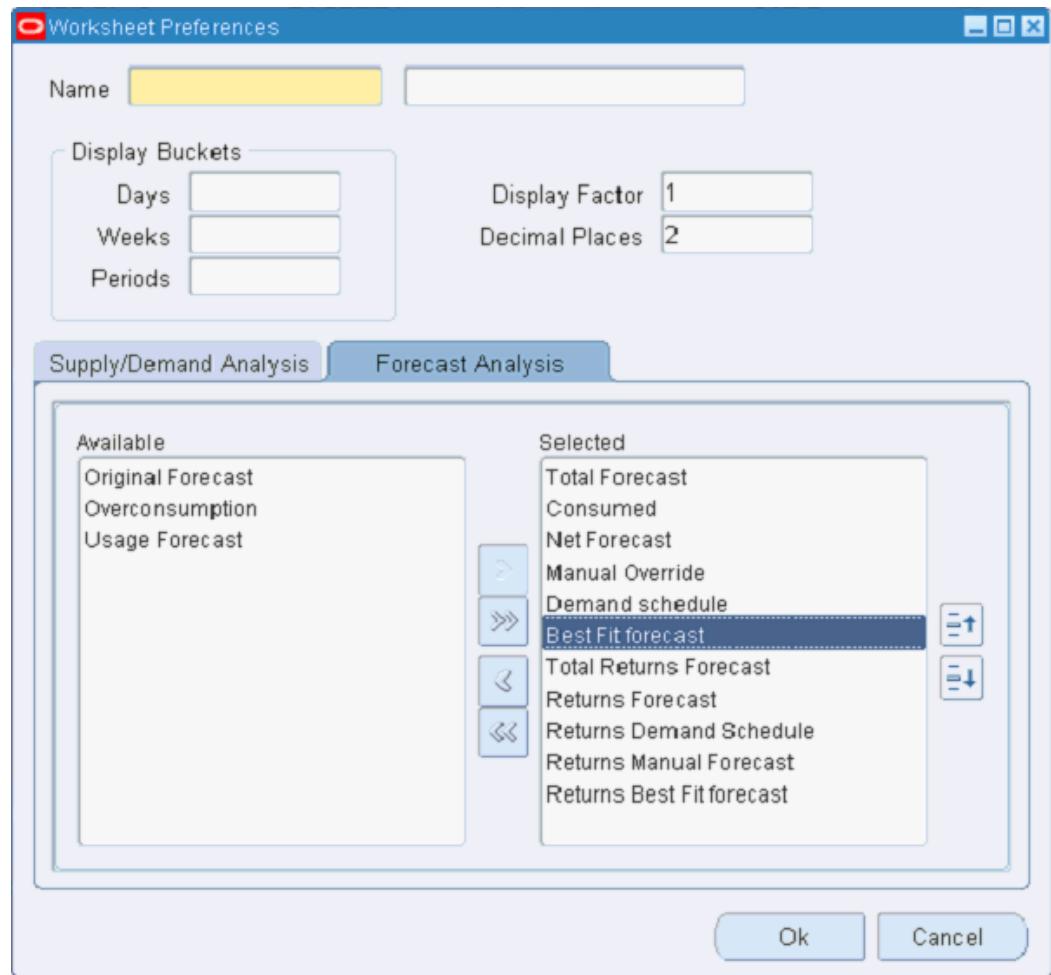
- Choose rows to be displayed
- Save the worksheet area and column width

- Set the number format
- Control colors for orders and negative values

You can select a saved worksheet preference from the Worksheet Preferences LOV. You can change the worksheet preference to display selected demand and supply rows. To do so, use the pull-down menu to select the named worksheet preference. By right-clicking, and then saving the worksheet preference that is open, you can choose to hide or show selected worksheet rows, and change the column width in the time bucket region.

Saving the worksheet also saves the geometry and layout of the various blocks. Only the changes to the current view are saved. You save the layout of the supply and demand analysis (SDA) and the forecast analysis (FA) views independently. To do this, you save changes once for the SDA view and once for the FA view.

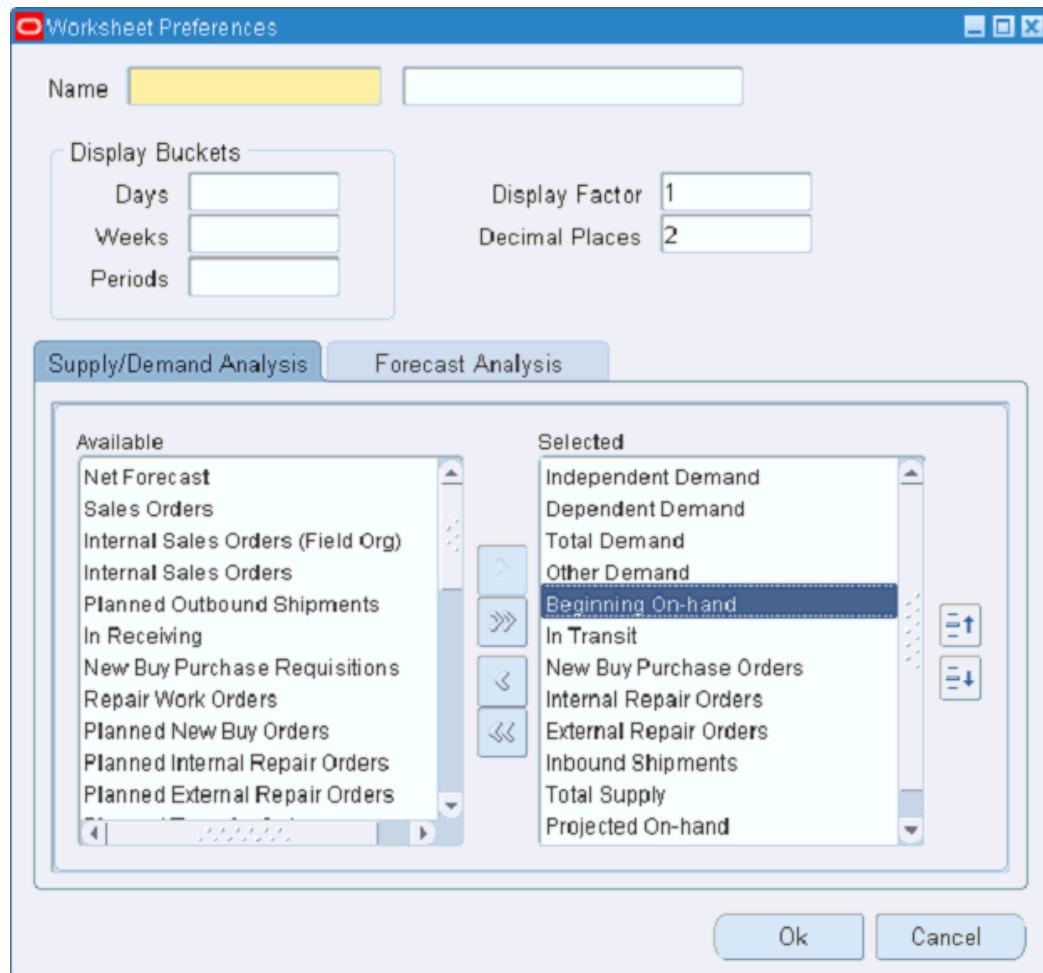
For example, if the user makes some layout changes in the FA view, and then switches to SDA view, and then saves the changes, only the SDA changes are saved.



For Forecast analysis, several Forecast and History row types are available. You can choose the rows to be displayed, and by moving rows up and down in the Selected column, you can determine the sequence in which you want the rows to appear.

For details, refer to the table Row Names in Forecast Analysis, page 9-19.

The Supply/Demand Analysis tab works similarly to the Forecast Analysis tab. You can choose the rows to be displayed, and organize them according to your preferred sequence.



For details, refer to Row Names Available Supply/Demand Analysis, page 9-14.

## Export Capability from Supply and Demand Analysis

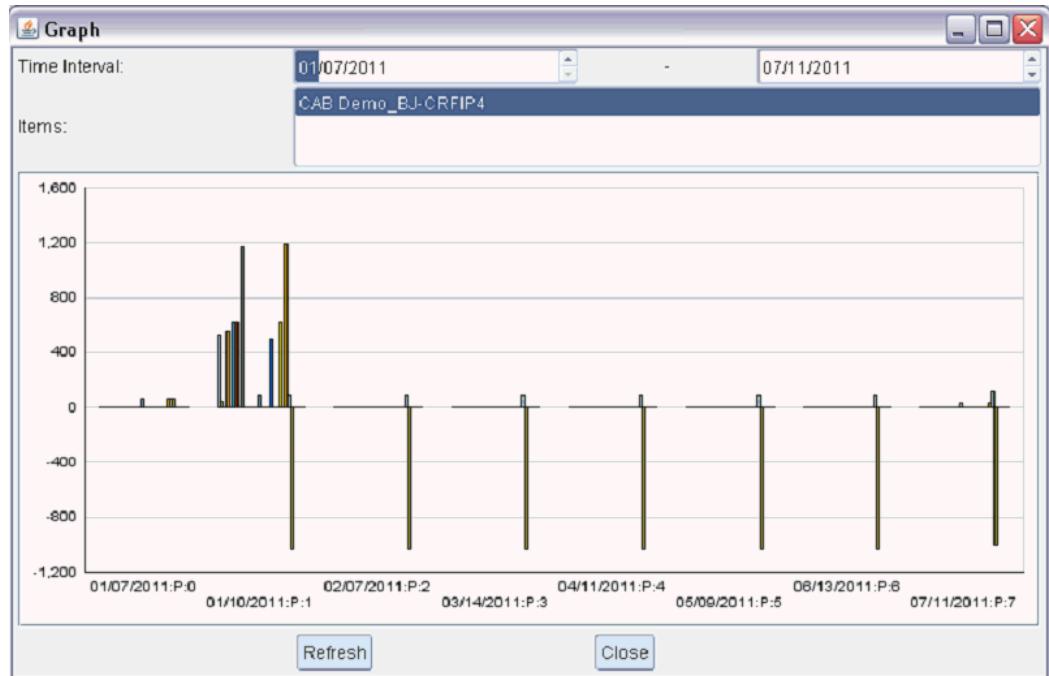
From the menu, select File > Export to export data from the item-organization or item-zone context to external spreadsheet applications using formats such as .csv and .xls.

## Graphs

From Supply and Demand Analysis, you can click the Graph icon, and then choose the rows and the time horizon to plot. The time range (from date, to date) for plotting the graph defaults from both the:

- History for the forecast, based on the forecast rule for the item
- Plan horizon

Additionally, you can choose certain cells in the forecast region of the worksheet, and then click the Graph icon. In this case, the scope of the graph (time period and rows) is determined by the selected cells.



In the Planner's Worksheet, you can display the destination and source rows for demand and supply. For outbound shipments, you can see the destination organization or for new buy supply, you can see the supplier information.

***The following dynamic rows are not available for graphing:***

Row	Validation	Description	Default
Graph Type	Line Graph, Bar Graph	Indicates the type of graph that is plotted. Line and bar graphs are supported.	Line Graph
Time Horizon From	Date	Indicates the start date from which to plot the graph.	The start date of the history
Time Horizon To	Date	Indicates the end date to which you want to plot the graph.	The time horizon date in case forecast horizon is greater than the planning horizon, else the plan horizon end date.

Row	Validation	Description	Default
Description	Display description of the category selected		

The forecast rule determines the default time horizon. The forecast rule provides the history range that needs to be considered. The start date of the history range is the from date in the graph.

Graphs are available only for the SDA subset of rows. That is, if the row is not selected for display in the SDA, it is not available in the graph. You can select or switch the rows appearing in the graph by using the right-click menu, and then selecting the hide/show row option. A shuttle window with the available and selected rows appears for you to select the rows to be graphed.

Multiple rows can be viewed for a given item, however, you can view only one item at a time. If multiple items match the selection criteria for graphing, then only the top item is graphed. The list of items that match the selection criteria appear in the Items field LOV. You can select another item or multi-select from the list if needed. If you have not selected an item in the SDA before clicking the graph icon, then all the displayed rows in SDA are graphed for the item context shown in the header region.

For example, a user selects Item1, Item2, and Item3, and then clicks the graph icon. The graph for Item 1 appears. The Items drop-down list of values contains Item1, Item2, and Item3. You can select one or multi-select any combination of Item1, Item2, and Item3.

#### Default Graph Type and Selections

The default graph type is line graph, with horizon equal to the Plan horizon from and to dates. The selected supply and demand types include Total forecast and Blended forecast. The bucketing used for graphing is the maximum planning bucket of the selection. The colors for the graph are predetermined, except when multiple items are selected for the same row. Thus, you cannot specify the color for individual rows.

You can hide or show graph legends, and use the right-click menu option to change the graph type.

## Creating Comments

Planners can specify comments for a service part. These comments are always in context to the part.

Comments persist from one plan run to another. The comments are specific to an item and are valid across plans. Knowing in which plan the comments were entered is useful. Thus, while saving the comments, the plan name is also saved. The original plan name appears in the comments.

**To enter new comments for a service part:**

1. Click the Add/Edit Comment icon in the Comments section of the Worksheet.

The Comments window appears. Here, you can create, view, assign, and save comments associated with the item.

***Description of key fields***

Field	Default Value	Meaning
Creation Date-Time	Not enterable	System date and time at the time of entering the comments
Created By	Not enterable	User who entered the comments
Assigned To	Null	You can change to any user in the system. The LOV contains all the users in the system having one of the service planning responsibilities.
Due By	Null	You can change to any future date. LOV opens the calendar.
Status	Null	LOV: Open, Closed, Pending, and Note.
Plan Name	Not enterable	Name of the plan in which the comment is entered
Comment Details	--	Text of the comment

2. To enter a new comment, click the Add New Comment icon in the main toolbar. This adds a new row, in which you can enter comments.
3. Enter the text of your comments in the Comments Details dialog box. The comment text area displays the entire text for the currently selected comment row.
4. To erase the selected comment, click Delete.
5. To discard any changes in the Comments table and dismiss the dialog, click Cancel.
6. To save the current state of the comments table to the database, click Save.

## Plan Actions (Exception Region)

### Actions View within Supply/Demand Analysis

The lower-right region of Supply/Demand Analysis displays exception messages for the chosen context of items and organizations.

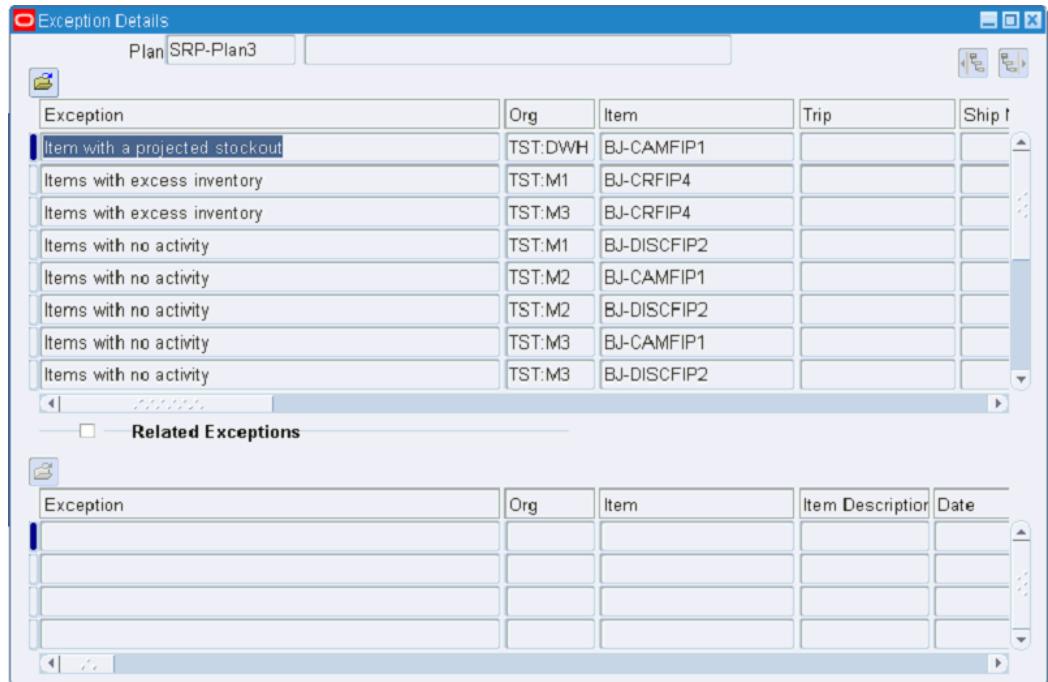
The display features are:

- Exceptions for the chosen item and organization context
- Displayed columns are shown in the following list:
  - Exception Description: A string value that is a concatenation of some of the key exception detail attributes  
See List of Exceptions in SPP, page 9-34
  - Action Taken
  - Priority
  - Age
  - Count (All)
  - Count (Action not taken)
- The ability to sort on any of these columns
- The ability to choose from the right-click menu to navigate to Exception Details

### Exception Details – Taking Action

You can take action on exception messages by selecting the Action Taken check box. This Action Taken status persists across planning runs. It is also used in conjunction with the Frequency setting on the Planner Work List to either include or exclude this action from the Planner's Work List.

The Exception Details window design is similar to that of Exception Details in DRP in that the Related Exceptions Display appears at the bottom of the window.



Feature	Description
Display of Custom Name	When you are navigating from a Planner's Work List record to the Exception Details window, the exceptions' custom names appear.
Additional Folder Columns	<p>The following folder columns are available to Exception Details. These folder columns appear by default when you are navigating to the Exception Details window from the Planner Work List.</p> <p>Generated Date: The date on which this exception was originally generated in the plan (see Exception Persistence, page 9-34)</p> <p>Age: Calculated as (Sysdate – Generated Date)</p> <p>Priority: The priority of this exception as calculated by the Planner Work List</p> <p>Action Taken Date: The date on which the exception was marked as Action Taken</p> <p>Action Taken By: – The user who took action on this exception Note: When the Action Taken attribute is reset to No based on planning frequency, the Action Taken By column reverts to null.</p>

## Exception Persistence

Exceptions persist from one plan run to another. When a plan runs, you can determine whether an exception message is a new one or one that existed in the previous plan run.

- If a message is new, it is assigned a generated date equal to the plan run date and time.
- If the message existed in the previous version of the plan, then the Generated Date and Action Taken status are inherited from the previous version.

The primary key (PK) for each exception type used to determine whether it is new or an existing exception is specified in the section "List of Exceptions in SPP", page 9-34.

## List of Exceptions in SPP

The following types of information are contained in this list:

- Name of exception group and exception type
- A long description of the exception
- The short description of the exception (to be used in the Supply/Demand Analysis screen)
- The related exceptions to this exception
- The right-click menu options that are enabled from this exception
- The attributes shown in Exception Details window
- The attributes that should be available as filter criteria in exceptions queries and planner work lists (and those criteria that allow Group By in an exceptions query)
- Attributes forming the primary key of the exception for persistence purposes
- Attributes identifying severity of the exception (to be used for threshold)

In Service Parts Planning, all exceptions are related to an item supersession chain. Service Parts Planning supports the following exceptions for usable parts:

- Past Due Forecast
- Past Due Sales Order
- Forecast Method/Parameter Change Recommendation
- Forecast Accuracy Audit Required

- Late Replenishment for Sales Orders
- Late Replenishment for Forecasts
- Sales Order / Forecast at Risk
- Material Shortage
- New Buy Supplier Capacity Overloaded
- Repair Supplier Capacity Overloaded
- Orders with Insufficient Lead Time
- Order Causes Supplier Capacity Overload
- Demand Quantity is not satisfied
- Organization Capacity Exceeded
- Order Violates a Business Calendar
- Order is Firmed Late
- Order is Firmed Early
- Items with a Projected Stockout
- Manual Allocation Causes Projected Stockout
- Items below Safety Stock
- Items with Excess Inventory
- Orders to be Rescheduled Out
- Orders to be Rescheduled In
- Orders to be Cancelled
- Sales Order Line
- Allocation Split
- Order Quantity Change
- Sales Order Cancellation

- Changes Recommended For Sales Orders
- Past Due Returns Forecast
- Past Due Orders
- Demand Satisfied using Supersession Item
- Inventory Exists for Superseded Item
- Internal Transfer Alternate / Changed Ship Method
- Order Uses Circular Source
- Planned Order Sourced From Alternate Facility
- Planned Order Sourced From Alternate Supplier
- Items with Negative Starting On Hand
- Items with Expired Lots
- Items with No Activity
- Supplier Split Percentage Violated
- Buy Orders
- Internal Repair Orders
- External Repair Orders
- Inbound Shipments

Service Parts Planning supports the following exceptions for defective parts:

- Material Shortage
- Order Violates a Business Calendar
- Order is Firmed Late
- Order is Firmed Early
- Items with a Projected Stockout
- Items with Excess Inventory
- Orders to be Rescheduled Out

- Orders to be Rescheduled In
- Orders to be Cancelled
- Items with Negative Starting On Hand
- Items with No Activity
- Outbound Shipment of Defective Item

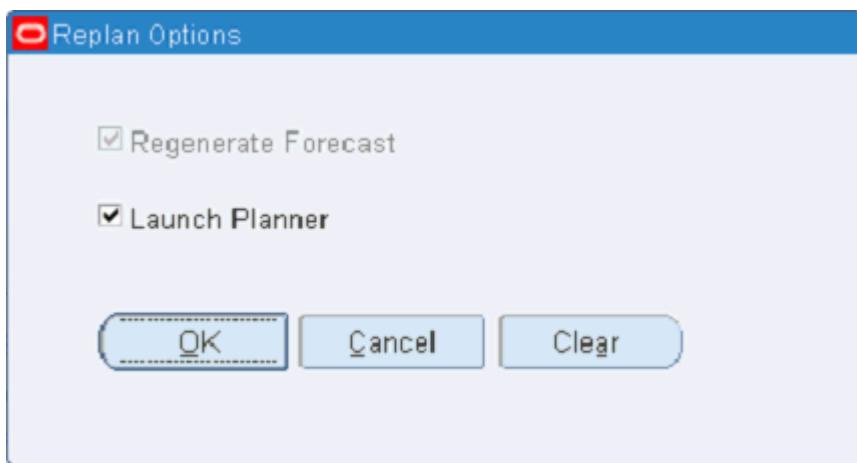
## Replan Options Window

You use the Replan Options window to regenerate the plan for the entire supersession chain for this item across all organizations as specified by the plan.

### To generate an incremental plan for the item being viewed:

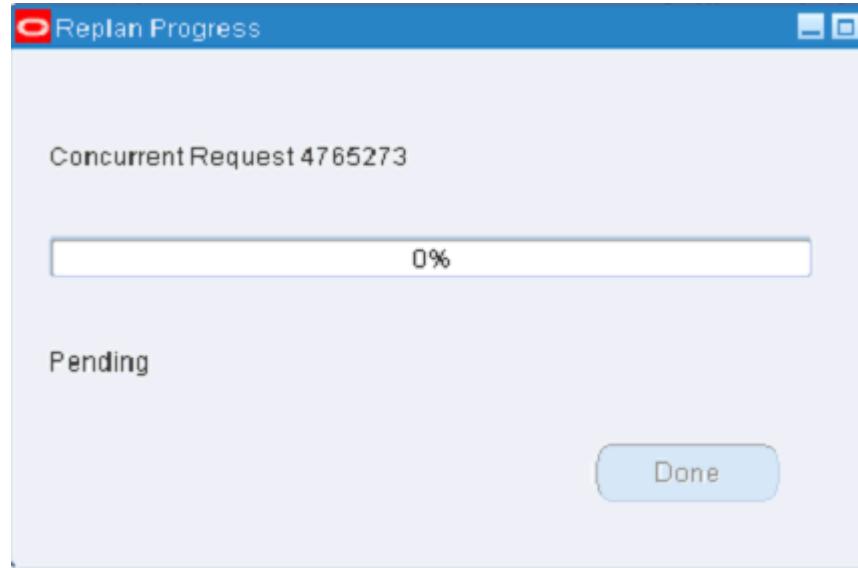
1. From the Supply Demand Analysis window click the Replan icon, or from the menu navigate Plan > Replan item.

The Replan Options window appears.



2. Click OK to submit the request.

The Replan Progress window is invoked on top of the worksheet.



The Progress bar has the following statuses (or milestones) for the plan run:

- Pending: This status appears while the concurrent program is waiting for a concurrent manager.
- Running – Loading data: This status appears while the concurrent program is loading the data.
- Running – Forecasting: When generate forecast is enabled, this status signifies forecasting in process.
- Running – Supply Plan: When the planner is enabled, this status signifies supply planning in process.
- Running – Exception calculations: When the planner is enabled, this status signifies exception generation.
- Completed: This status indicates the concurrent request successfully completed.
- Completed Warning: This status indicates that the concurrent request has finished, but with a warning.
- Error: The concurrent request has an error.

## Plan Summary Dashboard

The purpose of the Plan Summary dashboard is to answer the following questions:

- What parts of the plan need my attention?

See Actions Summary, page 9-40 and Planner Work List, page 9-41

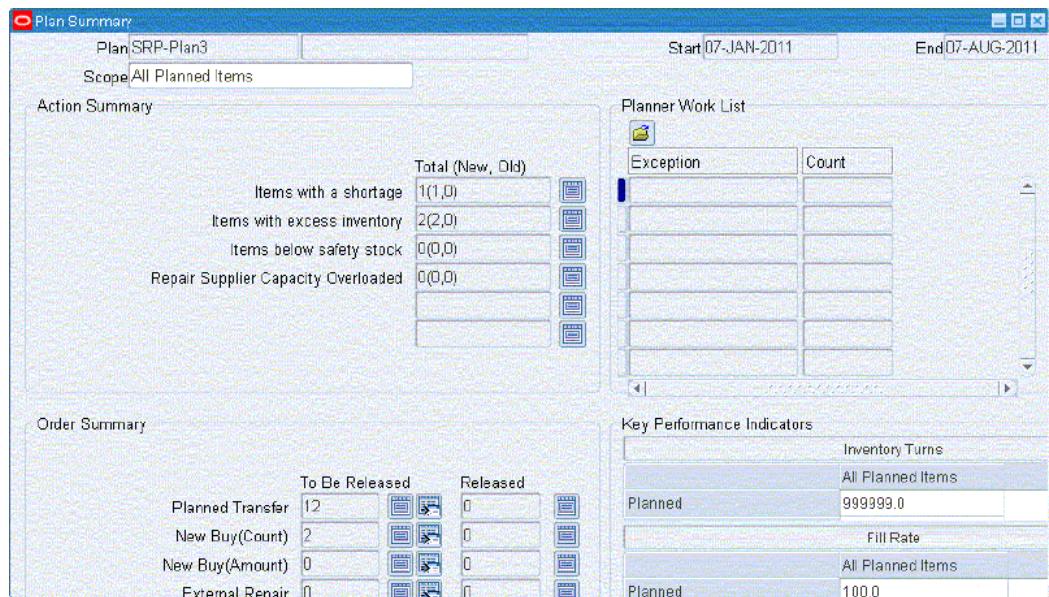
- What has the plan automated for me?

See the Order Summary, page 9-40.

- Does my plan meet my targets?

See the Key Performance Indicators, page 9-41.

You access the Plan Summary dashboard by clicking the Plan Summary icon in the main toolbar.



## Scope

At the top of the Plan Summary window, the Scope list of values includes: All Planned Items and Items: <Planner>. One entry exists for each valid planner in this plan.

The list of valid planners for a plan is derived based on the unique list of planners as determined from the active planner work lists defined in the Plan Options.

### Example

For example, in the Plan Options, three planner work lists are defined

- Planner Work List 1 > Access: Public > Group 1 > Planner 1, Planner 2
- Planner Work List 2 > Access: Personal > Planner 3
- Planner Work List 3 > Access: Personal > Planner 2

Then the planners in the drop down list are Planner 1, Planner 2, and Planner 3.

The following table describes Plan Summary region behavior based on scope.

Region	All Planned Items	Items: <Planner Code>
Actions Summary	Show all exceptions	Show only those exceptions where Exception.Item.Planner = <Selection>  If a certain exception type has no Item reference, then show all exceptions of that exception type
Planner Work List	Show the records of the current user's planner work list	Show the records of the selected user's planner work lists
Order Summary	Show all orders, based on user preferences	Show only those orders where Order.Item.Planner = <Selection>
Key Performance Indicators	Show KPIs for all items	Show only KPIs calculated for items where Item.Planner = <Selection>

## Actions Summary

The Actions Summary section shows a set of six exceptions and their counts, summarized across the plan.

- You can choose from the complete list which six exceptions you want to show in the Actions Summary.
- The Actions Summary shows the total count of exceptions, split by the number of new exceptions and the number of old exceptions, as well as the total number of exceptions present in the prior run of the plan.

You can click the icon located next to the exception count to access the Exception Details window where you can view exception details.

## Order Summary

The Order Summary shows a classification of orders based on order types, and the counts associated with each order type, based on the number of orders already released and those that are ready for release.

New Buy Amount = Sum of {Quantity \* Purchasing Cost} across the set of New Buy Orders that fall into the Released and To Be Released buckets

Orders that fall into the To be Released bucket can be determined in two ways:

- The specification of a time horizon. All orders with a start date within the time horizon are included in the To be Released bucket.
- The specification of an orders query. All orders that are present in the query output are included in the To be Released bucket.

## Planner Work List

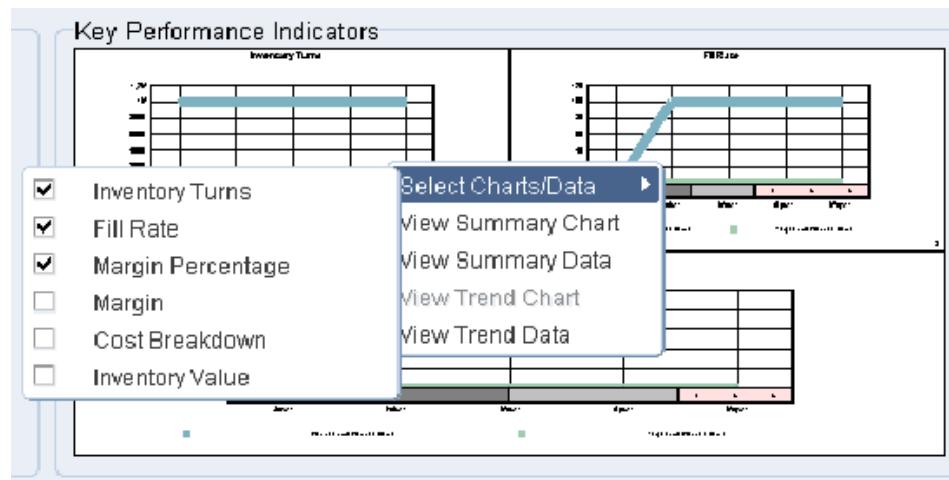
An extract of records from the planner work list are shown. The default folder of the Planner Work List window is used.

See Creating Planner Work Lists, page 9-44.

## Key Performance Indicators

This functionality provides the ability to:

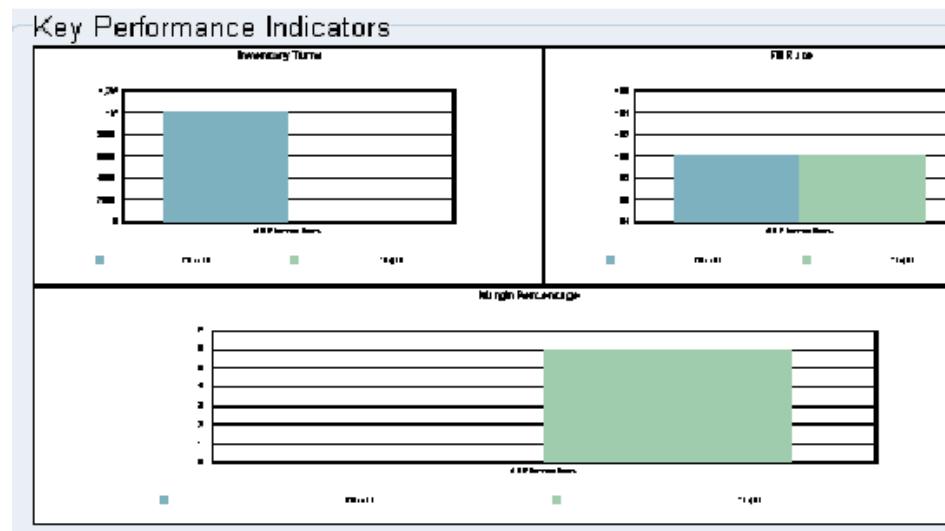
- View KPIs
  - As a Summary Chart



- As a Summary Data Table

Key Performance Indicators		
Inventory Turns		
	All Planned Items	
Planned	999999.0	
Fill Rate		
	All Planned Items	
Planned	100.0	
Margin Percentage		
	All Planned Items	
Planned	0.0	

- As a Trend Chart



- As a Trend Data Table

Key Performance Indicators						
Inventory Turns						
	Jan-11	Feb-11	Mar-11	Apr-11	May-11	
Planned - All Planned Items	0.000	0.000	0.000	0.000	0.000	0.000
Planned - All Planned Items	0.0	100.0	100.0	100.0	100.0	0.0
Fill Rate						
	Jan-11	Feb-11	Mar-11	Apr-11	May-11	
Planned - All Planned Items	0.0	100.0	100.0	100.0	100.0	0.0
Margin Percentage						
	Jan-11	Feb-11	Mar-11	Apr-11	May-11	
Planned - All Planned Items	0.0	0.0	0.0	0.0	0.0	0.0

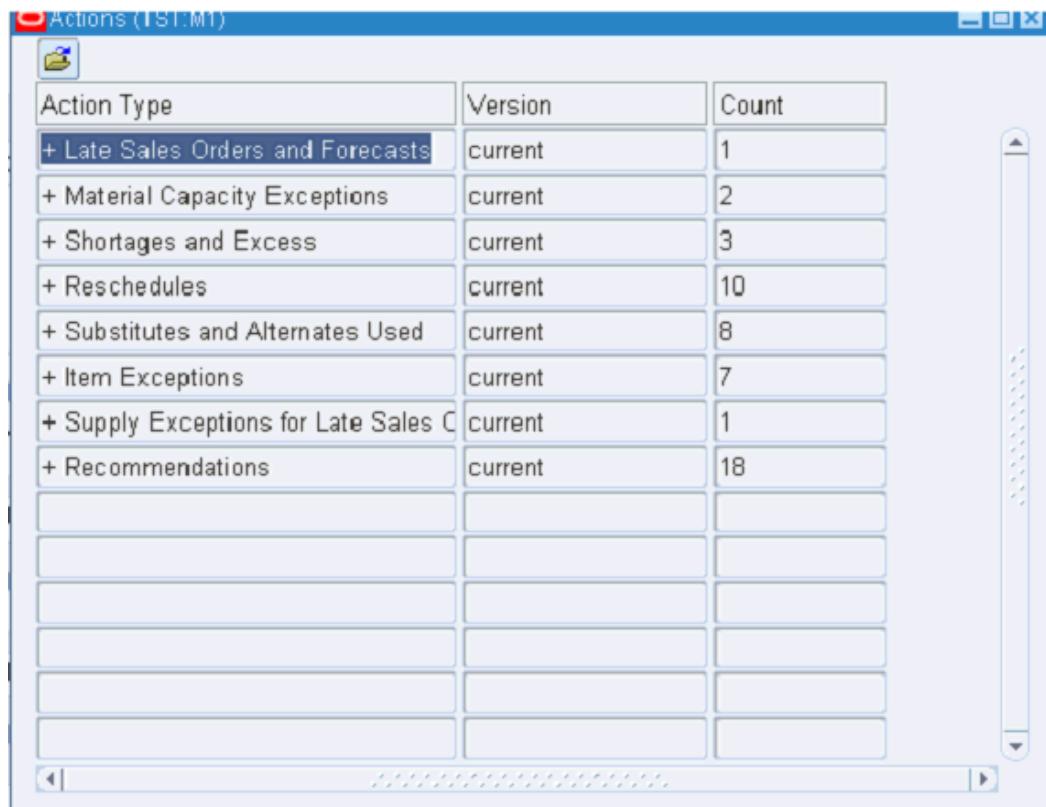
- Switch between the following KPIs:
  - Inventory Turns
  - Inventory Value
  - Forecast Accuracy
  - Fill Rate
  - Margin
  - Margin Percentage
  - Cost Breakdown (Cost types are purchasing, inventory carrying, and transportation)

**Note:** Only three KPIs can be shown at a time. When three are selected, the other choices become disabled. To open the possibility of selecting another KPI, deselect one of the currently selected three.

## Actions Summary Window

The Actions Summary window lists the action message types and quantities associated with implementing the selected plan. This summary is useful for assessing the impact of implementing alternative strategies.

To open the Actions Summary window, select the Exceptions Summary icon in the SPP toolbar



The screenshot shows a window titled 'Actions (TST:MT1)' with a toolbar icon of a clipboard with a checkmark. The window contains a table with three columns: 'Action Type', 'Version', and 'Count'. The data is as follows:

Action Type	Version	Count
+ Late Sales Orders and Forecasts	current	1
+ Material Capacity Exceptions	current	2
+ Shortages and Excess	current	3
+ Reschedules	current	10
+ Substitutes and Alternates Used	current	8
+ Item Exceptions	current	7
+ Supply Exceptions for Late Sales C	current	1
+ Recommendations	current	18

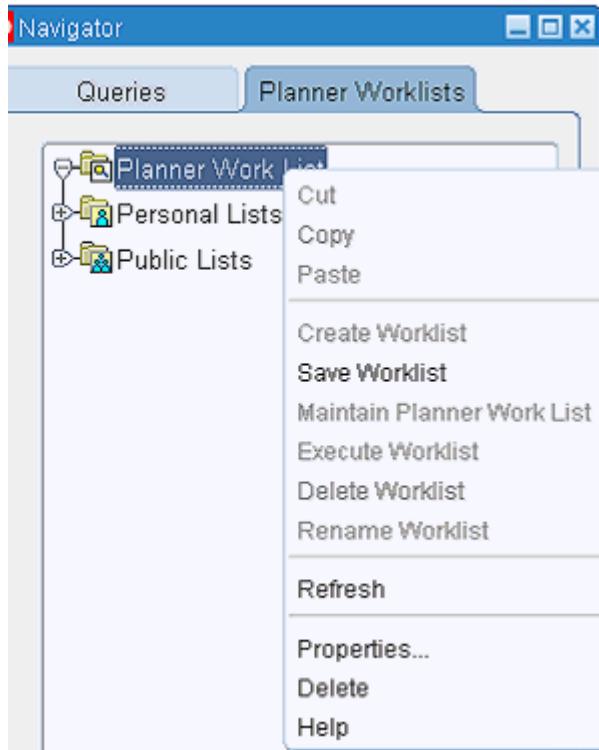
## Creating Planner's Work Lists

See also [Creating an Order Query, page 9-65](#).

### To create a new work list:

1. From the SPP main toolbar, click the Planner's Work List icon, or navigate from the menu bar > Tools > Planner's Worklist.

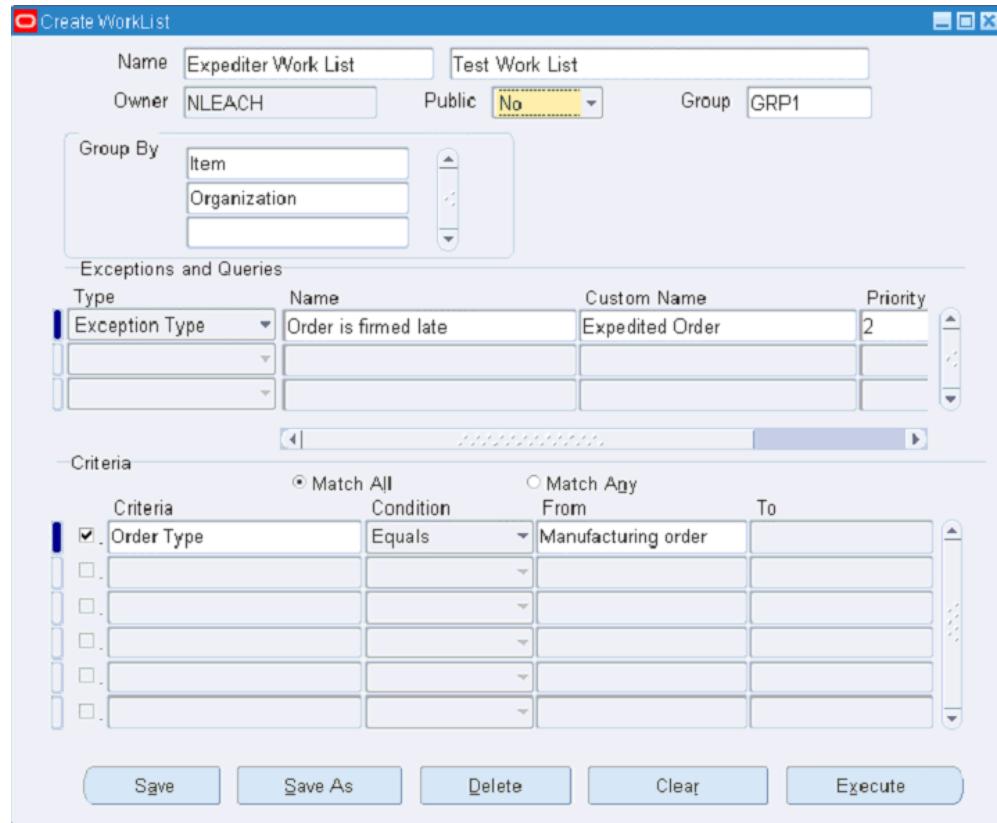
The Planner Work List tab appears on the Navigator window.



- Planner Work List
- Personal Lists: displays Planner Work List definitions that are marked as Public = No.
- Public Lists: displays Planner Work List definitions that are marked as Public = Yes.

2. Right-click Planner Work List, and then select Create Worklist from the right-click menu.

The Create WorkList window appears.



3. Enter a name and description for the work list.
4. Determine whether this work list will be public or private.
5. Specify the group by criteria for displaying the results of the work list.
6. (Optional) Select a work group. See Defining User Groups, page 9-55.
7. In the Exceptions and Queries region, select the type from the list of values.
8. (Optional) Enter a customer name, priority, and frequency.
9. If you chose the Type: Exception Type, you can enter query criteria in the Criteria region.
10. To save this work list without executing it, click Save.
11. To save this work list against another name, click Save As.
12. To erase this work list, click Delete.
13. To erase selected portions of the work list, click Clear.

- To create the work list, click Execute.

**Note:** To execute the work list, see Executing a Planner Work List, page 9-55.

### ***Create Worklist Fields***

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#### **Header region**

<b>Attribute Name</b>	<b>Description</b>	<b>Valid Values</b>	<b>Default Values</b>
Name	The name of the planner work list. The description field is shown beside name.	Any String	
Owner	Logon name of user who defined the planner work list	Non enterable field	
Public	Indicates whether this planner work list is available to just this user or to other users as well.	LOV: Yes, No	Depends on whether user entered this window from Public Lists (Yes) or Personal Lists (No)
Group	The name of a group of users. This field is enabled only if Public = No. Even though private, the work list is available to members of the specified group. See Defining User Groups, page 9-55.	A group defined in the User Groups form.	

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#### **Group By region**

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The selected criteria are used to group the results of executing the planner work list. One or more of the criteria can be selected. The available criteria are:

- Item
- Organization
- Supplier
- Supplier Site
- Customer
- Customer Site
- Exception Type
- Category
- Planner

The Group By specified in the planner work list overrides the Group By specified in the exceptions query.

Item and organization are default Group By values for a planner work list. You can change these default values in preferences.

**Note:** Validation requires at least one Group By value.

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#### Exceptions and Queries region

Attribute Name	Description	Valid Values	Default Values
Type	The type of planner work list entry	Exception Type, Exceptions Query, Items Query, Orders Query	Not applicable

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Name	<p>The name associated with the chosen type.</p> <p><b>Note:</b> You can specify the same exception name in more than one row, provided different custom names are created.</p>	<p>If type = Exception Type, then LOV contains all valid SPP exceptions (including Collaborative Planning exceptions)</p> <p>If type = Exceptions Query, then LOV contains all existing defined queries of type Exception (valid for this user)</p> <p>If type = Items Query, then LOV contains all existing defined queries of type Item (valid for this user)</p> <p>If type = Orders Query, then LOV contains all existing defined queries of type Orders (valid for this user)</p>	Not applicable
Custom Name	The custom name that applies to the seeded exceptions	Custom Names are only specifiable if Type = 'Exception Type'	Not applicable
Priority	<p>This is the priority associated with the underlying actions once the planner work list is executed</p> <p><b>Note:</b> Although two lines within the same planner work list, or two planner work lists, can refer to the same underlying action message but with different priorities, only a single priority is maintained at the Action Message level.</p> <p><i>Overlapping results between two work lists, or between two lines in the same work list definition is an undesirable result of inconsistent setup.</i></p>	<p>Integer <math>\geq 1</math></p> <p><b>Note:</b> Although two lines within the same planner work list, or two planner work lists, can refer to the same underlying action message but with different priorities, only a single priority is maintained at the Action Message level.</p> <p><i>Overlapping results between two work lists, or between two lines in the same work list definition is an undesirable result of inconsistent setup.</i></p>	Not applicable

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Frequency	Time period, in days	Integer $\geq 0$	0 (zero)
The frequency is used as follows:			
If an exception has Action Taken, then at the time the planner work list is executed again, the following check is performed:			
<ul style="list-style-type: none"> <li>• Planner work list execution date <math>&gt;</math> (action taken date + frequency)?</li> <li>• If Yes, this exception can cause an Item to be in the planner work list. Exception is reset to Action Taken = No.</li> <li>• If No, this exception cannot be the cause of an item being in a planner work list and will not be visible through the planner work list</li> </ul>			
Zero frequency means that this exception is valid every time the planner work list is executed.			

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#### Criteria region

The criteria section lists the criteria that can be specified on an exception type.

For any exception with an Item reference All Items, query criteria is available in the Criteria section with the Item – prefix, for example, Item- Processing Lead Time.

---

## Windows Available from the Worksheet Tools Menu

You can navigate to the following windows from the Worksheet Tools menu.

## Order Details

Org	Item	For Release	Firm	Order Type	Part Cond	Sugg Due Date	Qty/Rate
TST:M2	BJ-CRFIP4			Sales Orders	Usable	17-JAN-2011 23:59:00	-20.0
TST:M2	BJ-CRFIP4			Sales Orders	Usable	21-JAN-2011 23:59:00	-8.4
TST:M2	BJ-CRFIP4			Sales Orders	Usable	17-JAN-2011 23:59:00	-10.0

Maximize Pegging

▼ BJ-CRFIP4/TST:M2 Qty 20 on 17-JAN-2011 23:59:00 (Sales Orders 63804, Mixed, ORDER ENTRY(3.1))  
↳ BJ-CRFIP4/TST:M2 Qty 30 Pegged Qty 20 on 17-JAN-2011 00:00:00 (Planned Transfer)  
↳ BJ-CRFIP4/TST:M3 Qty 30 Pegged Qty 20 on 14-JAN-2011 23:59:00 (Planned order demand)

The SPP Plan Order Details has three enabled tabs:

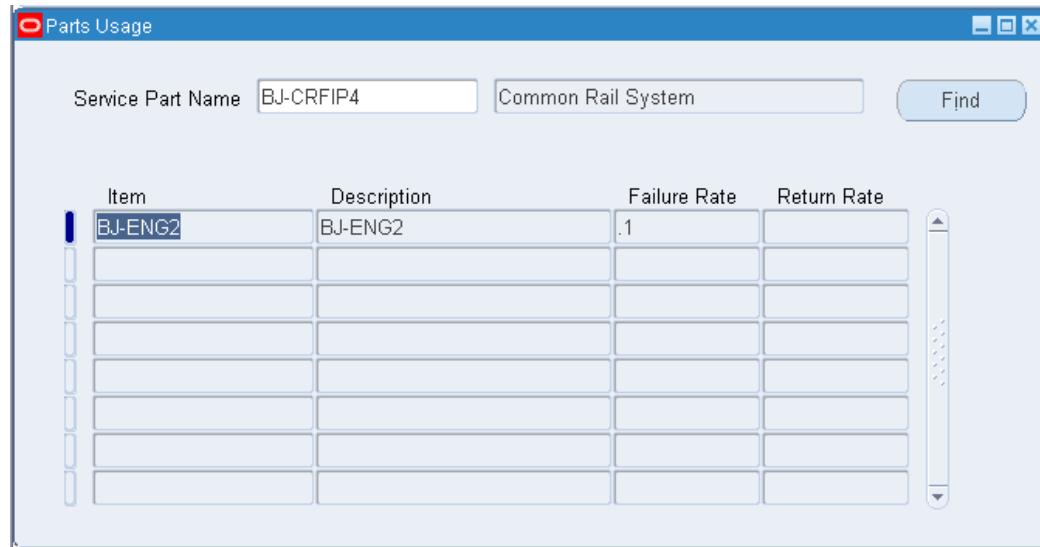
- Order
- Release Properties
- Source.

These are similar to the corresponding tabs in ASCP and DRP. See "Supply/Demand Window" in the "Planner Workbench" chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

Select the Maximize Pegging check box to expand the lower pane of this window.

## Parts Usage

Planners can open the spare Parts Usage window in context of the selected item. This window lists all the products, or spare part modules, in which this particular part is used for maintenance or service. This is a view of what is defined in the Failure Rates window.

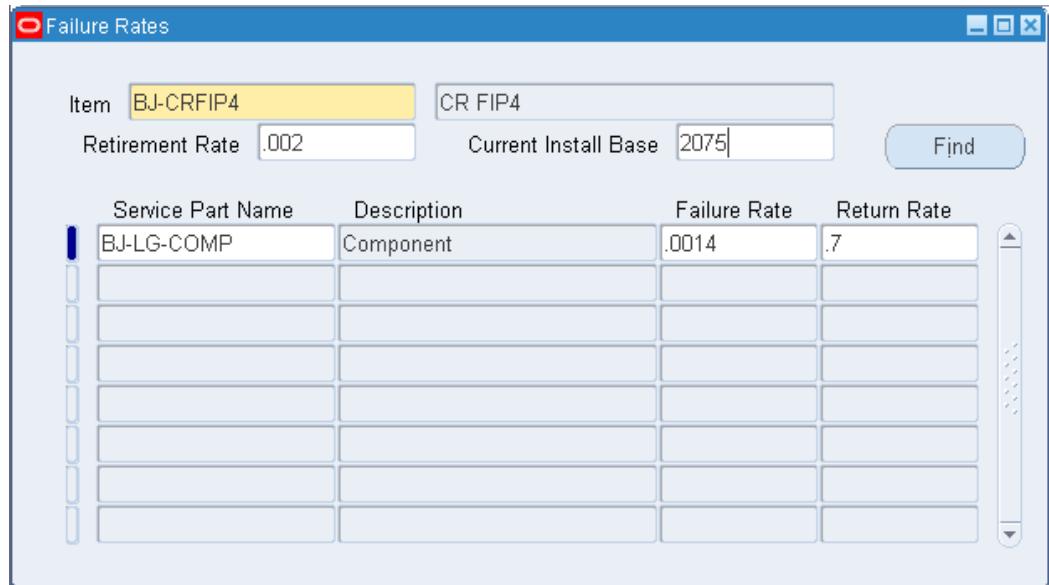


## Failure Rates

In context of a product, the Failure Rates window enables you to define failure rates and return rates for product and service part combinations.

Parent product to child relationships can be collected from Spares Management. Collections pulls and displays this data in the Failure Rates window, as well as in the Parts Usage window. Failure rates can be uploaded using flat file or legacy loads. You can also manually update failure rates.

For related information, see Determine Service Part Failure Rates, page 4-18.



## Allocation

SPP supports supply allocation based on demand priority.

See Priority Pegging in the Planner Workbench chapter of the *Oracle Advanced Supply Chain Planning Implementation and User Guide*.

## Pegging Properties

From the Order Details window, right-click the pegging tree. From the right-click menu you do one of the following actions:

- Expand the pegging tree
- Refresh or open the pegging properties window.

The following information is shown in the pegging properties window:

- Item/Organization
- Item Description
- Source Org/Supplier
- Supply Type
- Supply Date
- Need by Date

- Quantity
- Order Number
- Unit Number
- Project
- Task
- Lending Project
- Lending Task
- End Customer
- End Item/Organization
- End Item Description
- End Demand Type
- End Demand Date
- End Satisfied Date
- End Demand Quantity
- End Demand Pegged Quantity
- End Order Number
- End Unit Number
- End Project
- End Task
- End Demand Calculated Priority
- End Demand Source Priority
- End Lending Project
- End Lending Task

## Defining User Groups

### To define user groups:

1. From the Service Supply Chain Planner responsibility, navigate to the User Groups window.

Setup > User Groups



The screenshot shows a software window titled 'User Groups'. At the top, there is a text input field labeled 'Group' containing the value 'SRP Group'. Below this, there is a table with two columns: 'User Name' and 'Description'. The table contains five rows of data:

User Name	Description
JKRISHNAN	Jayarama
BJOYCE	
VKNARAYA	
PARUMPUL	

2. A free-form group name can be entered against one or more users in the form to group them together. The User Groups form displays all users associated with the Service Supply Chain Planner responsibility.
3. Click Save. This is the group that can then be specified in the Create Work List definition form.

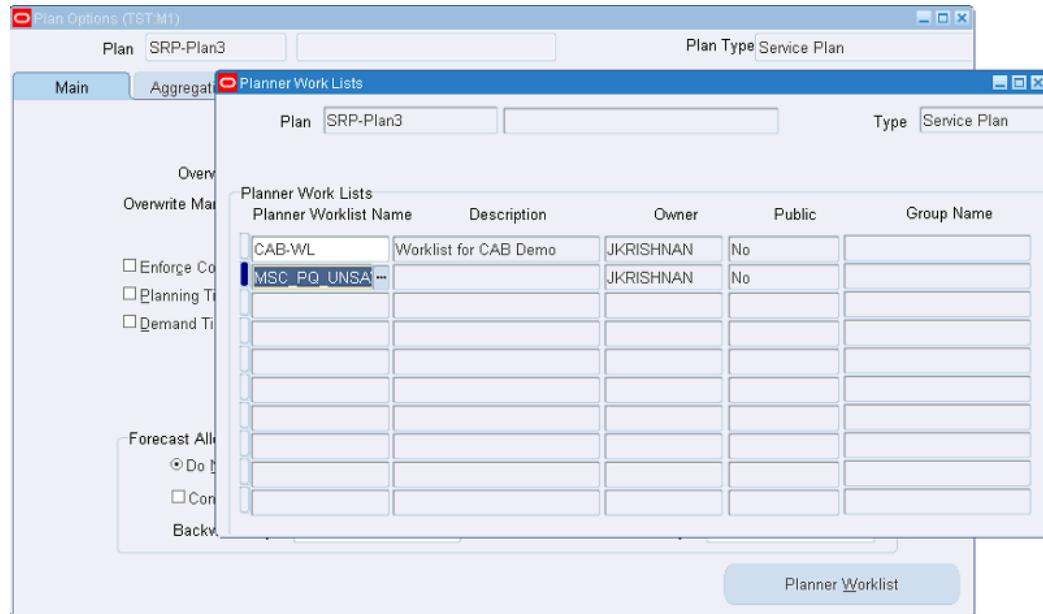
## Executing a Planner Work List

You can execute planner work lists in two ways.

- As part of a plan run, if this planner work list is specified through plan options. See Specifying Planner Work Lists as Part of Plan Run, page 9-55.
- From the Planner Work List tab in the Navigator, select a planner work list, and then select the Execute Worklist icon.

## Specifying Planner Work Lists as Part of Plan Run

A set of planner work lists as specified in the following form are precomputed as part of the plan run. The form is accessible from the Plan Options form for SPP by clicking the Planner Work Lists button in the Main tab.



Planners can add planner work lists that they have defined, as well as planner work lists defined for user groups to which the planners belong. Further, planners can select one of the public work lists as a default work list. The default public work list is available for planners who do not have any work lists defined in User Preferences.

In interactive planning, the work lists associated with the plan are not refreshed online. An offline concurrent request is submitted to refresh the work lists. When planner accesses work lists that are in the process of being generated, the following warning message appears:

The work list is currently being refreshed. Please reopen the work list when concurrent request \_\_\_\_\_ has completed.

If the user selects Yes, then the work list is not opened. If the user selects Cancel, then the work list opens. However the data will be old or will be missing, if the previous data has already been deleted as part of the refreshing process.

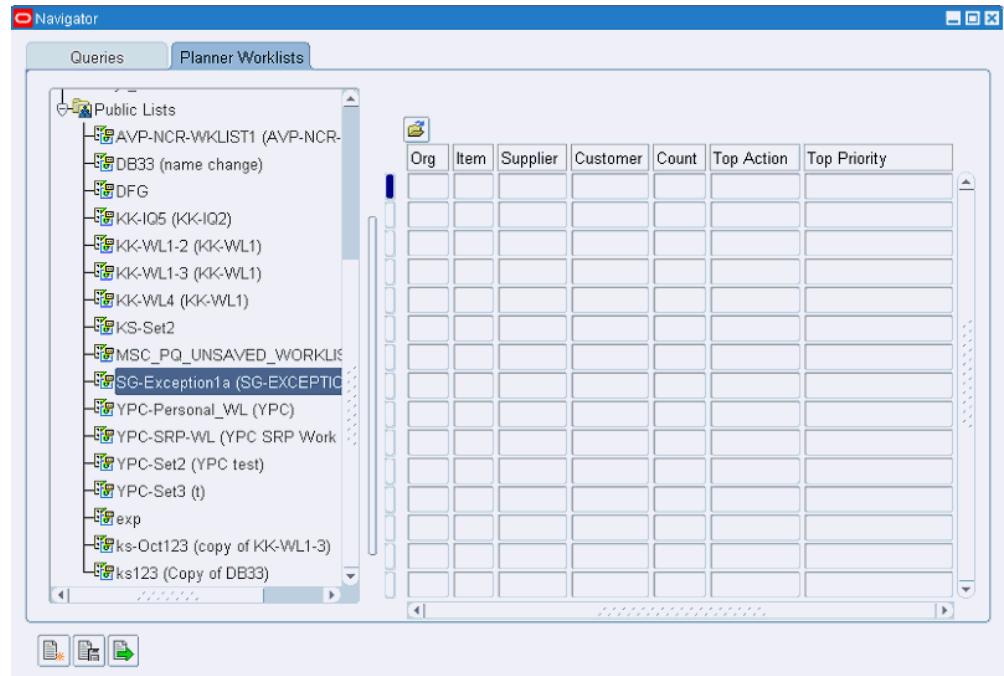
## Viewing Planner Work List Results

## To view the results of executing a planner work list:

1. Click the View Planner Work List icon in the SPP toolbar.

The default planner work list for this user appears.

2. To view a nondefault work list, open the pull-down list of planner work lists that are available to you, and then select one.



The Planner Work List Results window is similar to the Query Results window. Similar to the Query Results, this portion of the window appears to the right of the Navigator. By default, the navigator is hidden

### ***Features of the Planner Work List Results window***

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<b>Feature</b>	<b>Description</b>
Folder	<p>This window is folder-enabled as well as Folder &gt; Find-enabled. The folder columns are:</p> <ul style="list-style-type: none"><li>• Item</li><li>• Org</li><li>• Supplier</li><li>• Supplier Site</li><li>• Customer</li><li>• Customer Site</li><li>• Exception Type</li><li>• Category</li><li>• Planner</li></ul>
Default Columns	<p>When the Planner Work List window is opened as a result of executing a planner work list query, the default columns displayed always include:</p> <ul style="list-style-type: none"><li>• Top Priority</li><li>• Top Priority Action</li><li>• Total Count</li></ul> <p>In addition, the default columns displayed always include the columns chosen as Group By. For example, if Item and Organization are chosen as Group By, then Item and Organization columns appear by default when the planner work list is executed.</p> <p><b>Note:</b> If the user has specified a default folder for the Planner Work List window, then the default folder definition dictates which columns to show or hide.</p> <hr/>

---

Feature	Description
Top Priority	This is the highest priority among all the actions within the chosen level of Group By for that record in the planner work list.
Top Priority Action	This is the action message associated with the top priority. If multiple action messages share the same top priority, then one is chosen at random. If the top priority corresponds to an items query or orders query, the corresponding query names are shown.
Total Count	The total count of actions for that planner work list record
Right-Click Menu	<p>The right-click menu on records in the planner work list includes the usual forms right-click options plus the following:</p> <p>Planner Work List - Exceptions: All the underlying flagged exceptions for this planner work list record opens in the Exceptions Details window. If this planner work list record has no exceptions associated with it, this right-click option is disabled, or grayed out.</p> <p>Planner Work List - Orders: All the underlying supplies that are flagged as a result of including orders queries within the planner work list open in the Supply window.</p> <p><b>Note:</b> A folder column called Planner Work List Priority appears in the Supply window, and is visible by default only when the Supply window is accessed using this right-click option.</p> <p>Planner Work List - Items: All the underlying items that are flagged as a result of including items queries within the planner work list open in the Items window.</p>

---

Feature	Description
Buttons	<p>The following enabled buttons appear at the bottom of the Navigator.</p> <ul style="list-style-type: none"> <li>• Supply/Demand Analysis: Opens the Supply/Demand Analysis window for this item. This button is enabled only if the Group By definition includes Item.</li> <li>• Supply: Opens the Supply window to show all supplies for the chosen record using the Group By criteria as filters. For example, if Group By is item and organization, then all Supplies for the item and organization are shown. If Group By is supplier and item, then all supplies for that item and supplier combination are shown.</li> <li>• Items: Opens the Items window to show all the Items for the chosen record using the Group By criteria as filters.</li> <li>• Exceptions: Opens the Exception Details window to show all exceptions for the chosen record using the Group By criteria as filters.</li> <li>• Comments: Opens the Comments window for the chosen record. This button is enabled only if the Group By includes Item.</li> </ul>

## User Preferences Window - Main Tab

You can create named preference sets on the User Preferences window. On the Main tab, you can specify default preferences for:

- Main:
  - Default Plan Name
  - Default window
- Personal Query for Auto-Execution

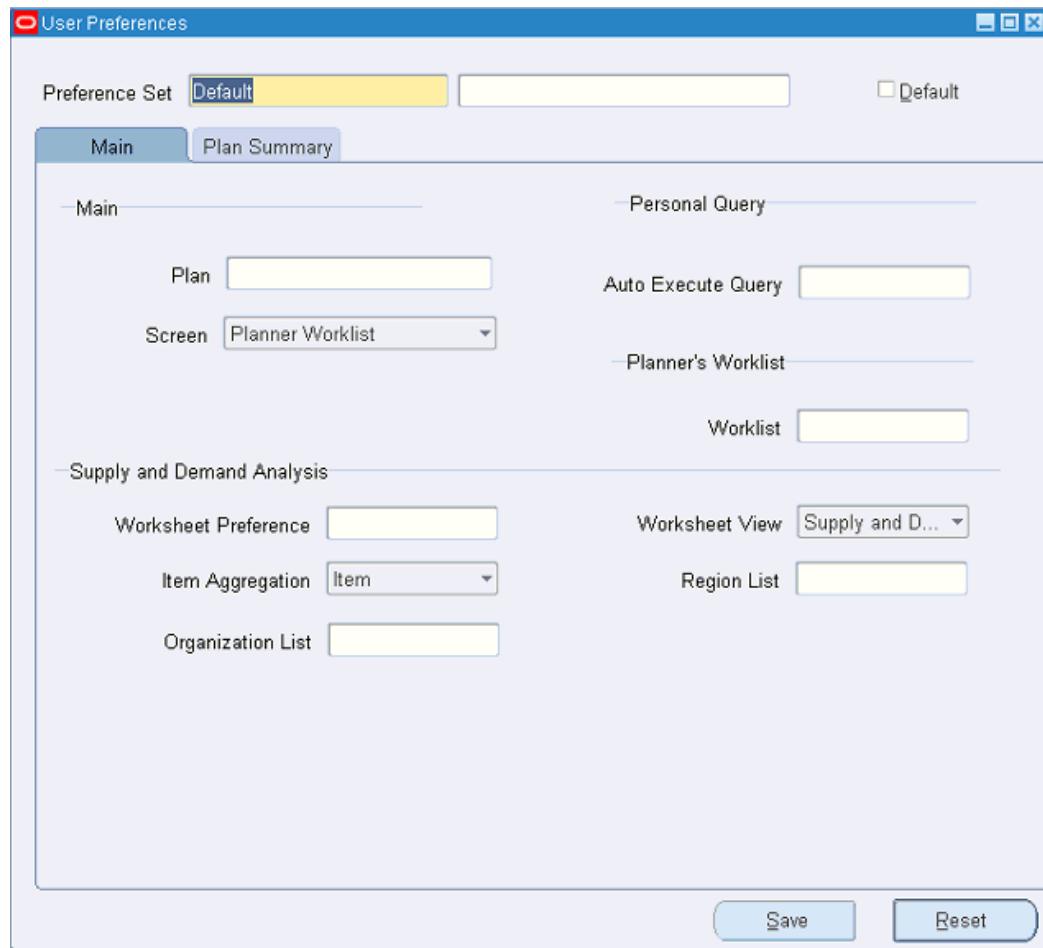
In addition to specifying an item, exception, supplier, or resource query for auto-execution, you can specify an order query here.

- Planner's Work List Name
- Supply and Demand Analysis:

- Worksheet Preference Name
- Worksheet View
- Level of Item Aggregation
  - Item
  - Prime
  - Supersession
- Region (Zone) List Name
- Organization List Name

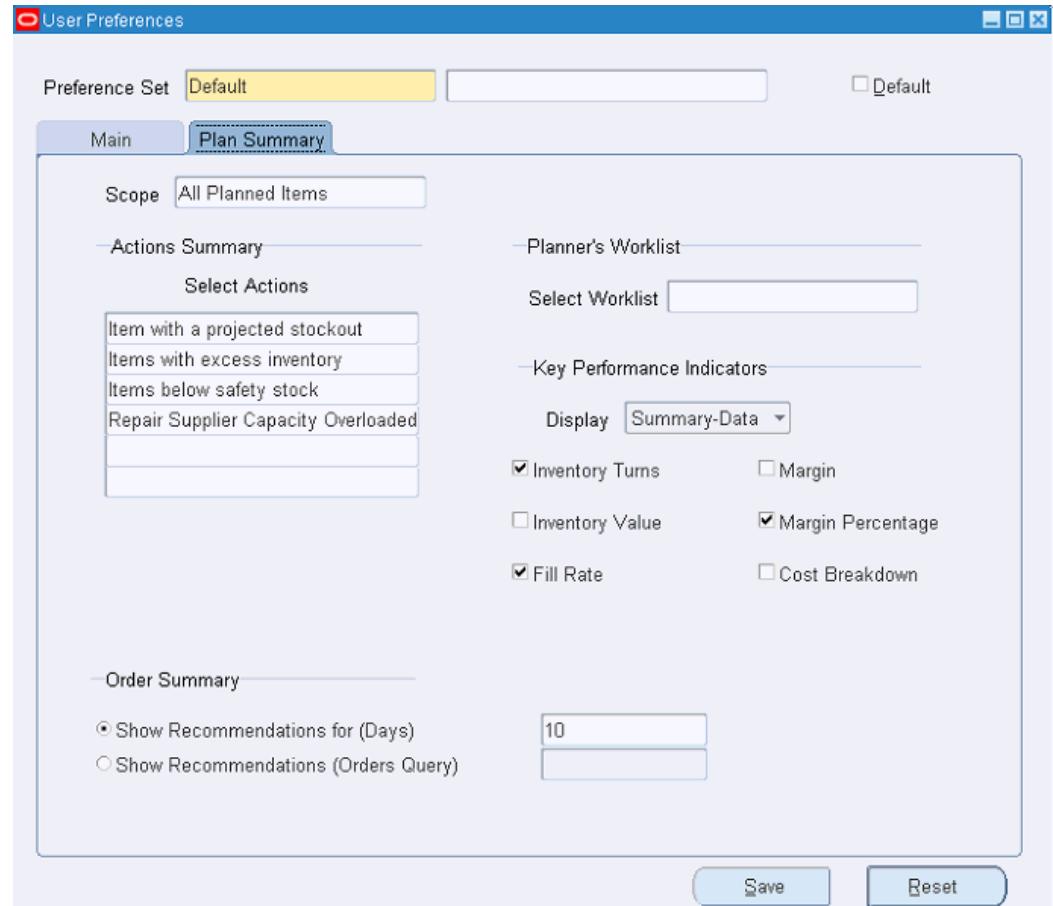
Saving User Preferences saves the region configuration of the Supply and Demand Analysis window. For example, you minimized the Item Location and Comments regions. The worksheet shows just the Supply and Demand worksheet and the Exceptions Summary. When you save and then reopen the Supply and Demand Analysis window, the window retains this configuration.

When both the organization list and zone list are specified, when you open the Supply and Demand Analysis window, the default view is the organization context. The zone list is disabled, or grayed out. By default, all organizations appear.



## User Preferences - Plan Summary Tab

You access the Plan Summary User Preferences window by clicking the User Preferences icon in the main toolbar, or from the menu, select Tools > User Preferences. On User Preferences, select the Plan Summary tab.



The table describes the regions and fields on the Plan Summary tab.

Region – Field	Description	Valid Values	Default Value
Preference Set	The name (and description) of the preference set.		
Default	Indicates that the named preference set is to be the default preference set.	Yes, No	No
Default Scope	Determines whether the Plan Summary scope opens with the scope set to All Planned Items or to a specific Items: <Planner Code>	All Planned Items, Items: Planned Items, Items: <Planner Code>	All Planned Items

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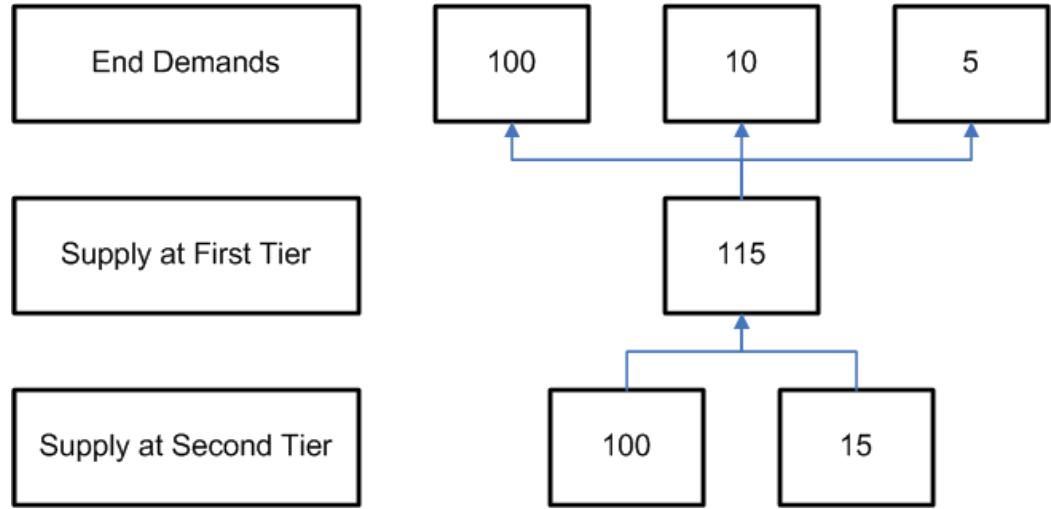
Actions Summary – Select Actions	Actions Summary – Select Actions	LOV exceptions See List of Exceptions in SPP, page 9-34.
Order Summary – Show Recommendations for (Days)	The radio button for selection enables the field for specifying the number of days to show for release recommendations.	Positive integer 10
Order Summary – Show Recommendations (Orders Query)	The radio button for selection enables the field for specifying the order query for release recommendations.	Any valid orders query name
Planner Work List – Select Work List	This LOV of valid planner work lists is displayed for choosing a different planner work list.	LOV containing the list of valid planner work lists for the user.
KPI Display	This LOV provides a choice of default KPI display types.	Trend-Chart, Trend-Data, Summary-Data, Summary-Chart
Default KPIs to show	Check boxes for selection of available KPIs	Select maximum of three KPI check boxes

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## Pegging in SPP

Pegging in SPP is done level by level. You can see supply to demand pegging (and vice versa) across multiple levels of the supply chain. The supply and demands shown in the pegging user interface are the constrained supplies and demands as calculated by the planning engine. Because end-demand pegging is not supported, you do not necessarily have visibility to the exact quantity allocated to a given end demand, for a given supply, occurring at all locations in the supply chain.

Example of level-by-level pegging:



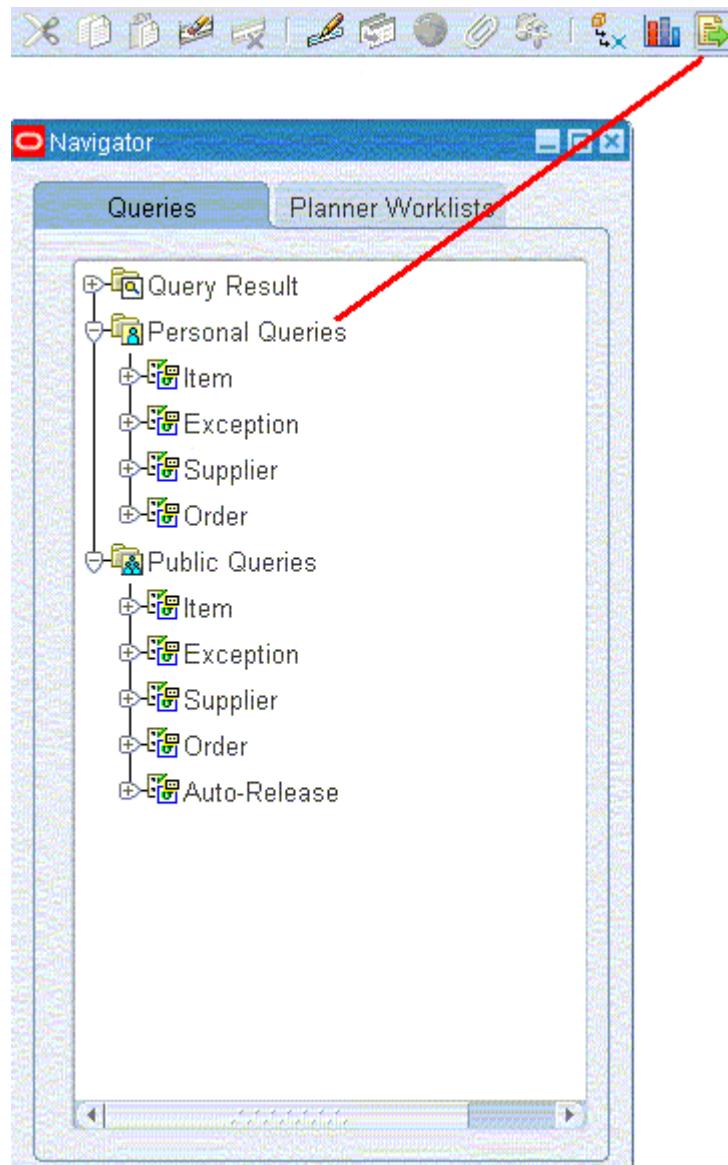
At the second tier supply node of 100, you cannot determine how many of the 100 are being allocated to each of the end demands of 100, 10 and 5. However, you can ascertain that the supply of 100 can potentially impact all three end demands that the parent (first tier) supply is pegging to.

## Queries

### Creating an Order Query

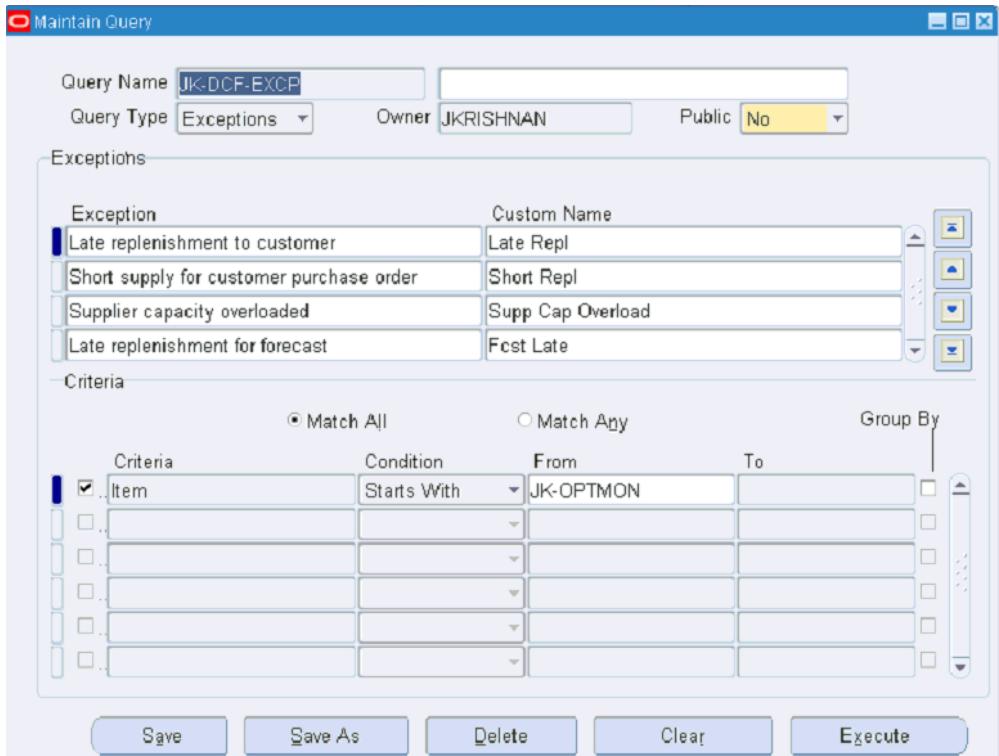
For SPP, the two query types are (order) queries and planner work lists. An order query is a set of conditions that, when evaluated, results in a set of orders. Order queries are similar to an item queries or exceptions queries available in the APS suite.

1. Click the Query tool in the toolbar to reveal the set of queries associated with the plan.



2. To create a new order query, right-click the Order Query tab, and then choose the Create Query option from the right-click menu.

The Maintain Query window appears.



3. You use the Maintain Query window to create or edit queries.
  - To create a new query, enter the query name and optionally, the description.
  - To edit an existing query, inquire on the query name field, and then select the query.
4. Select the query type. The query type Order is available for SPP users.
5. The Owner field is automatically completed from the user logon information.
6. Determine whether the query will be public, or available only to the owner.
7. In the Exceptions region, select an exception from the list of values. You can use the arrows to organize the sequence of exceptions.
8. \
 

In the Criteria region, define the criteria for the highlighted exception. The set of allowed criteria for an order query and the associated conditions that go with them are summarized in the table Available Criteria for Order Queries, page 9-68.
9. Select a radio button to determine whether *all* or *any* one of the criteria specified in the query criteria need to be satisfied for an order to be displayed upon executing

the query.

10. To save the query without executing it, click Save.
11. To save the query against a different name, click Save As.
12. To erase the highlighted exception, click Delete.
13. To erase the selected criteria row, click Clear.
14. To execute the query, click Execute.

## Available Criteria for Order Queries

The set of allowed criteria for an order query and the associated conditions that go with them are summarized in the following table.

Criteria	Condition	From	To
Order Type	Equals, Is not, Among, Starts with	Order Types LOV	
Due date,	Equals,	<Value>	
Dock date,	Is not,	<Value>	<Value 2>
Ship Date,	Between,	<Value 1>	<Value 2>
Order Date,	Days from today,	<Value>	
Start Date,	Among, Outside, Greater than, Less than	<Value> <Value 1> <Value> <Value>	

Criteria	Condition	From	To
Quantity	Equals,	<Value>	
	Is not,	<Value>	<Value 2>
	Between,	<Value 1 >	
	Less than,	<Value>	
	Greater than,	<Value>	
	Among	<Value 1>	
Amount	Equals,	<Value>	
	Is not,	<Value>	
	Is less than,	<Value>	
	Is greater than,	<Value>	
	Between	<Value 1>	
Supplier	Equals,	LOV	
	Is not,		
	Among,		
	Between,		
	Starts with		
Customer	Equals,	LOV	
	Is not,	(Customers and technicians modeled as customers)	
	Among,		
	Between,		
	Starts with		
Item	Equals,	LOV	
	Is not,		
	Among,	<Value>	
	Between,		
	Contains		

<b>Criteria</b>	<b>Condition</b>	<b>From</b>	<b>To</b>
Ship From ,	Equals,	LOV	Location
Ship To	Is not,	Organization,	Customer Site
	Among,	Customer,	Supplier site
	Between,	Supplier	
	Starts with		
Order Number	Equals,	LOV	
	Is not,		
	Among,		
	Between,		
	Outside,		
	Starts with,		
	Greater than,		
	Less than		
Planner	Equals,	LOV	
	Is not,		
	Among,		
	Between,		
	Starts with,		
	Contains		

Criteria	Condition	From	To
Change forecast method or parameter	Does not exist		
Late Replenishment for Sales Orders			
Late Replenishment for Forecasts			
Sales Order / Forecast at Risk			
Allocation Constraint			
New Buy Supplier Capacity Overloaded			
Orders with Insufficient Lead Time			
Order Causes Supplier Capacity Overload			
Demand Quantity is not satisfied			
Organization Capacity Exceeded			
Order Violates a Business Calendar			
Order is Firmed Late			
Order is Firmed Early			
Items with a Projected Stockout			
Items Below Target Inventory Level			
Items Above Target Inventory Level			
Items above Maximum Inventory Level			
Manual Allocation Causes Projected Stockout			
Items below Safety Stock			
Items with Excess Inventory			
Orders to be Rescheduled Out			

Criteria	Condition	From	To
Orders to be Rescheduled In			
Orders to be Cancelled			
Sales Order Line Allocation Split			
Order Quantity Change			
Sales Order Cancellation			
Changes Recommended For			
Sales Orders			
Past Due Returns Forecast			
Past Due Orders			
Demand satisfied using			
Supersession Item			
Inventory Exists for Superseded			
Item			
Internal Transfer			

## Combining Existing Queries to Create a New Query

You can combine multiple existing queries, each with an associated set of query criteria, to create a new order query.

1. Choose the names of existing custom queries.

For example, consider an order query consisting of two queries and associated criteria:

- Query 1 – Good Transfer Orders
 

Criteria:

Order Ship Date < 1 week from today, and

Order Type Equals Planned Transfer, and

Forecast Exception does not exist
- Query 2 – New Buy Orders
 

Criteria:

Order Ship Date < 1 week from today, and

Order Type Equals New Buy

2. Select either Match All or Match Any to define whether all or at least one of the criteria specified in the query criteria need to be satisfied for an order to be displayed upon executing the query.

When this new order query is executed, the display includes:

- Transfer Orders, with no Forecast Exceptions on the item transferred, which are shipping within one week from today, and
- New Buy Orders that are shipping within a week from today.

Orders resulting from the execution of each custom query in this set are displayed together. This query does not display any other type of order, such as a repair order. It also filters out transfer and new-buy orders with ship dates that are beyond one week from today.

## Auto-Execute Order Queries

Order queries can be automatically executed when a workbench is opened. This is defined in the Workbench Preferences, under the Main tab. In addition to specifying an item, exception, supplier or resource query for auto-execution, you can also specify an order query for auto-execution.

See User Preferences – Main, page 9-60.

## Order Queries and Supply Demand Find Criteria

Executing an order query retrieves a set of orders in the Supply window. If the Default folder in the Supply Demand window has any criteria for filtering the set of orders to be displayed, these criteria further filter the set of orders that result from executing the order query.

To see exactly the set of orders that result from executing an order query, disable the order FIND criteria in the Default folder. This ensures that the folder serves only as a mechanism for controlling the layout and sorting the orders in the display.

## Deleting Order Queries

When an Order Query is deleted, you receive the same warning message that the system issues when you delete public and private item queries.



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## Release Process

### Introduction

As part of repair and replenishment planning, SPP recommends planned orders (planned internal repair order, planned external repair order, planned repair work order, and planned new buy order) and reschedule or cancellation recommendations. The system reschedules internal requisitions and internal sales orders in pairs. These need to be released in pairs as well. Planners can automate the release process (Auto release orders) or manually implement planned orders.

Service supply chain planning recommends various planned orders related to the reverse supply chain. These orders are implemented as source documents that can be transacted against.

You can use order queries to help you with order review and release. An order query is a set of conditions evaluated on all the orders in a plan. Execution of the query results in a set of orders satisfying the conditions expressed in the query. You can review these orders, edit them if necessary, and then release them.

See [Creating Order Queries, page 9-65](#).

### Release for External Repair (Push and Pull)

Planning generates planned orders to move defective material for repair, and also to move repaired, usable material from the repair supplier. Planned order recommendations are converted and implemented as defective inbound and defective outbound shipments to move defectives. SPP creates an external repair order (purchase order) to receive repair parts and pay for the service.

Planning calls the Spares Management Application Program Interface (API) for release of the orders to the source. From planning, only the planned external repair order can be executed. The remaining documents tied to this document, namely repair work order and the defective outbound shipment, are created by Spares Management.

Additionally, Spares Management automates and manages the execution process related to movement of inventory.

Planning calls the Spares Management API with the release of the planned order related to the repair purchase order, and also pushes the details of the planned order for repair and movement of defectives to the repair supplier. Essentially, a single repair planned order results in the release of three separate orders to Spares Management.

Spares Management ensures that a purchase order is approved for repair before generating the internal sales order (ISO) to ship defectives to the repair supplier. The ISO (source organization) is based on the planning recommendation. That is why only the planned external repair order can be executed from planning.

## Release for Internal Repair or Depot Repair

For cases in which the depot organization is the same as the warehouse organization, planning generates one order, which is the internal repair order. In this special case, it is the repair work order.

For cases in which the depot organization is different from the central warehouse organization, planning generates three separate planned order recommendations for internal repair. They are:

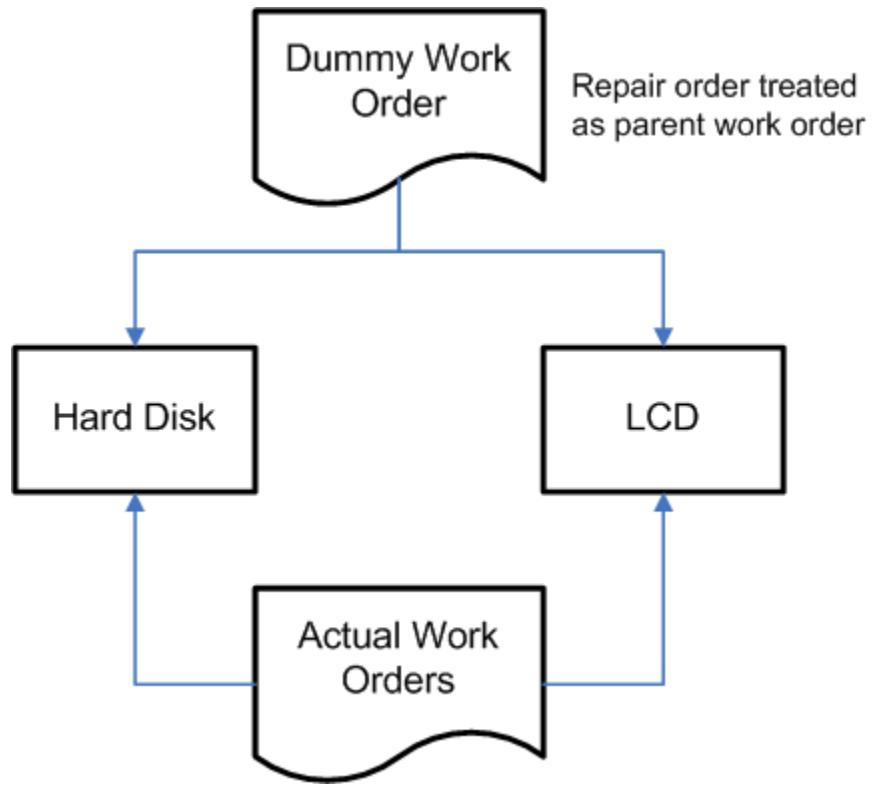
- Order to move defectives in for repair (defective outbound shipment)
- Non standard repair work order to repair the part and product (repair work order)
- Order to move usable inventory to the demanding organization (internal repair order)

Planning releases the move orders (internal repair order and defective inbound and outbound shipment) independently of the repair work order. Planning calls the Depot Repair API and releases the repair planned order to Depot Repair. Depot Repair generates a repair order and maintains the repair work order under the Repair Orders definition.

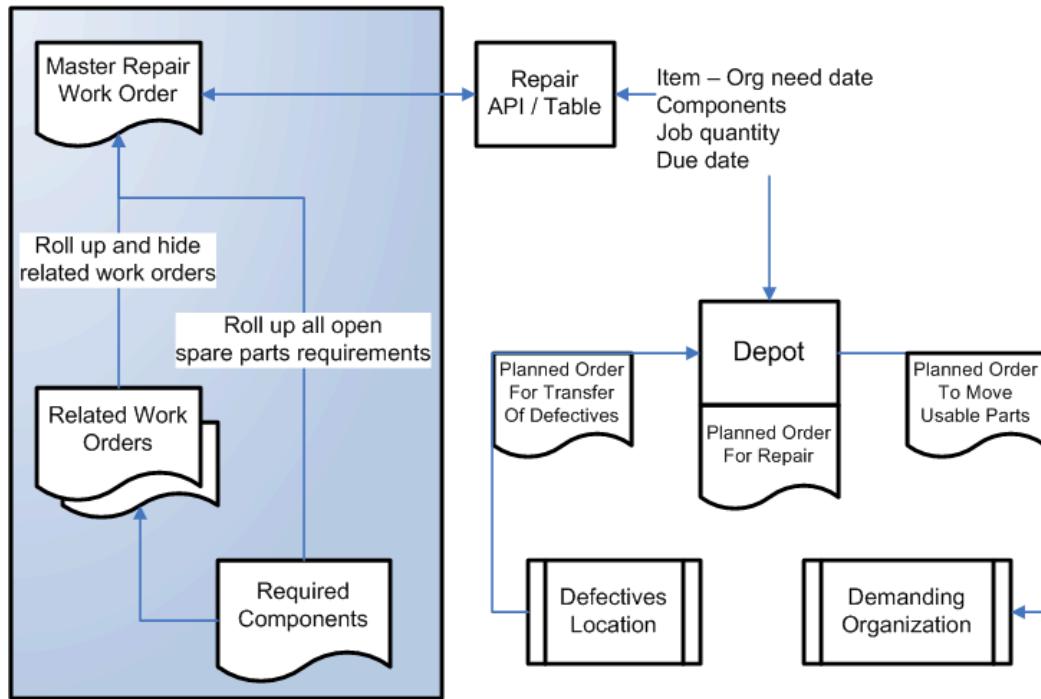
Planning reads the repair order as a dummy non standard job in Service Parts Planning. It assumes that the repair order is the parent work order. Planning also assumes that the components required in this dummy work order are all the components for which the particular repair order has repair work orders.

This assumption helps planning overcome the flexible repair work order definition in Depot Repair, where a repair order for a parent item could actually have repair work orders for subassembly parts. For example, the repair order could be for the Computer, which could have multiple repair orders. Each repair order could be tied to one or more repair work orders. These repair work orders could be for the LCD and hard disk subassemblies. Additionally, the same hard disk being repaired could have more than one work order attached to it.

Planning identifies all the repair work orders associated with the repair order.



Depot Repair generates a new repair order type called *Refurbishment*. This repair order includes the movement of defectives and the related repair work orders. Planning identifies all the repair work orders associated to the repair order.



Oracle SPP supports the case in which the defectives are present in the depot as well as the case in which defectives are moved just in time for repair, assuming that the defective and the usable warehouses are separate warehouses.

## Multiple Repair Work Orders for Same Part

Planning identifies when the same part is being repaired using multiple repair work orders. This is required so that planning does not try to pull more defectives than necessary. For example, if ten work orders to repair the same hard drive, then planning sees the demand for the defective only once.

## Serial Controlled Items and Depot Repair

Oracle Depot Repair generates individual work orders for items that are under serial control. When planning generates a cumulative planned order for the repair work order, Depot Repair splits and generate multiple orders as necessary.

**Note:** To ensure proper planning, all the organizations where internal repair work takes place must be marked as depot organizations in the Instance – Organization form.

## Release Process to Move Defectives

Planning generates transfer orders (for internal requisition and ISO) to move defectives

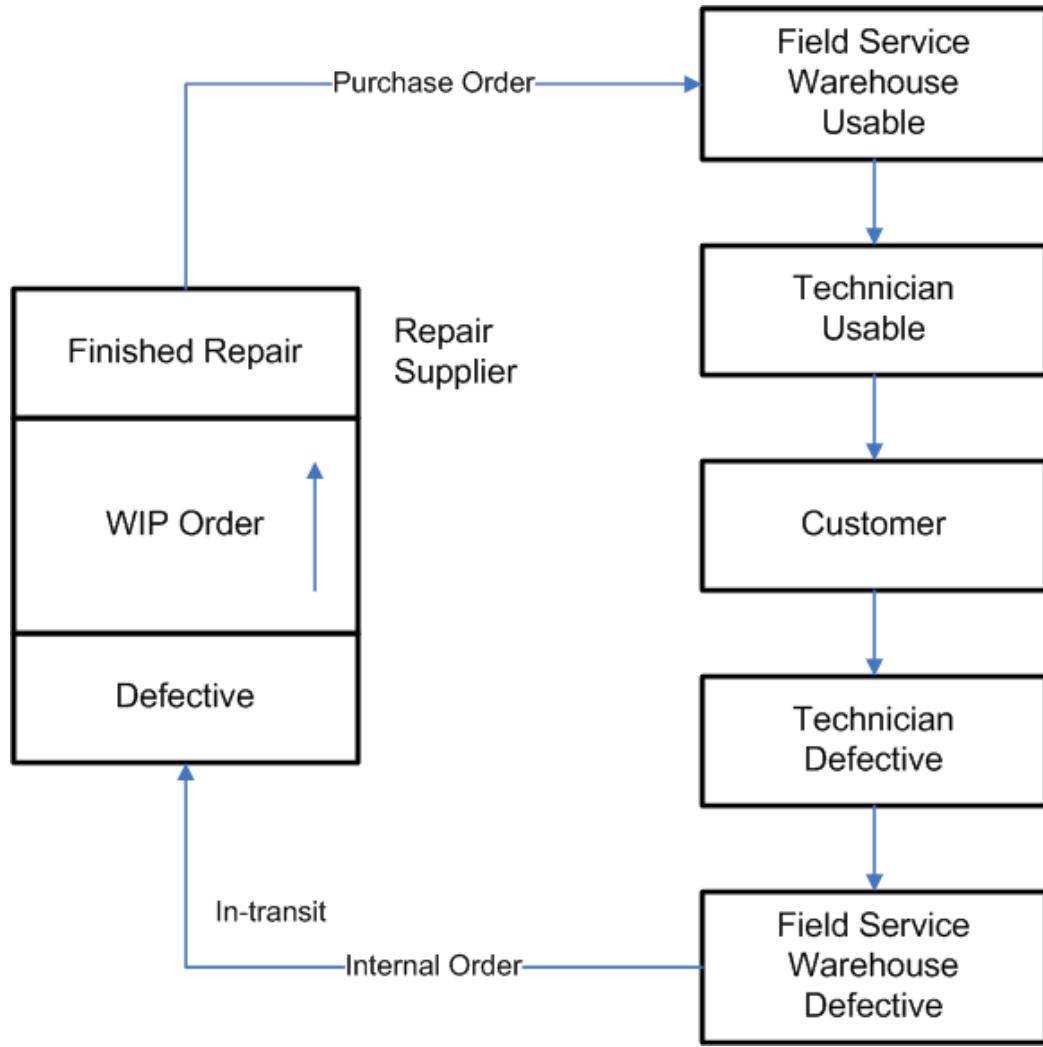
closer to the repair organization, depending on whether the relationship with the repair supplier is a pull or push type relationship. Planners can selectively implement the planned orders as internal requisitions (defective outbound and defective inbound shipments).

## External Repair Execution Management

### External Repair - Pull

For the external repair organization, Oracle workflow automates the steps in the following process:

1. When the defective internal sales order ships from the defective warehouse, auto expire in-transit quantity into on-hand balance at the defective subinventory of the repair organization.
2. Receive the material into the default defective subinventory at the repair organization.
3. On receipt of the inventory into the defective subinventory at the repair organization, create a non standard Work In Process (WIP) job and issue the defectives to the WIP job.
4. Based on the repair lead-time, complete the WIP job into the usable subinventory.
5. On receipt of the purchase order at the central warehouse, use a miscellaneous issue transaction to account for moving the received quantity from the usable subinventory to the material account against which receipt has taken place at the warehouse.
6. Manually adjusted any deviation from the norm.



Spares Management and APS repair execution - normal mode. The normal mode is where defectives are not prepositioned at the repair supplier in advance of need.

1. Planner reviews and approves repair recommendation in planning system
2. Repair requisition automatically generated
3. Buyer verifies purchase order details and creates repair purchase order, or purchase order auto created based on preexisting repair agreement.
4. Purchase order approved.
5. Internal order auto created and defective parts shipped to repair supplier.
6. Defective parts received at repair supplier into defective subinventory, or Defective parts auto received into defective subinventory.

7. WIP order auto created when internal order received into defective subinventory. Defective parts transacted out of the defective subinventory to the WIP order.
8. WIP order auto completed based on predefined repair time. Defective parts are transacted into the Finished Repair subinventory.
9. Repair supplier ships repaired parts to the field service warehouse against the purchase order.
10. Field service warehouse receives repaired parts on the purchase order.
11. Repaired parts are transacted out of the finished repair subinventory.

## External Repair - Push

The external repair organization push (or preposition) process steps include:

1. Creating auto receipts at the repair organization's defective subinventory based on the supplier's confirmation of defective shipments.
2. Creating a new a nonstandard discrete job when the purchase order is created for repair.
3. Issuing defectives to the nonstandard work order.
4. Completing the work order based on repair lead time, or when the purchase order is auto-received.
5. On purchase order auto-receipt, issuing material out of the repair organization.
6. Manually adjusting any deviation from the norm.

Spares Management and APS repair execution - preposition mode. The preposition mode is where defectives are prepositioned at the repair supplier in advance of need.

1. Planner reviews and approves prepositioning recommendations in planning system
2. Internal order to preposition defectives is auto created and defective parts are shipped to the repair supplier
3. Repair supplier reports receipt of preposition internal order and receipt is transacted into defective subinventory
4. Planner reviews and approves repair recommendation for prepositioned defectives in planning system.
5. Repair requisition automatically generated

6. Buyer verifies purchase order details and creates repair purchase order, or Repair purchase order auto created based on preexisting repair agreement.
7. Purchase order is approved
8. WIP order auto created when purchase order approved. Defective parts transacted out of the defective subinventory to the WIP order
9. WIP order auto completed based on predefined repair time. Defective parts are transacted into the finished repair subinventory.
10. Repair supplier ships repaired parts to the field service warehouse against the purchase order.
11. Field service warehouse receives repaired parts on the purchase order
12. Repaired parts are transacted out of Finished Repair subinventory.

## **Direct Shipments and Auto-Receipt of Internal Requisitions at Repair Supplier**

This process is typically used to avoid manual receipts at the repair supplier organization. You can set up the interorganization transfers to be direct, in which case the shipped internal sales orders are automatically received into inventory on completing the shipment transaction.

If the shipping network between the defective warehouse and the repair organization is set to Direct, then the defective part shipment is auto-received against the internal requisition into the repair organization. The repair work order start and end date calculation includes the actual transfer lead time.

For example, the time to repair is 10 days and the time to transfer defective material is 20 days. When the defective item is shipped, it is auto-received into the repair supplier organization. Spares Management creates the work order with a lead time of 30 days (20 + 10) and issues the defective part to it.

## **Plan Execution**

### **External Repair – Pull and Push**

Third party repair or external repair planning is a key feature of the design for service supply chain. When the planning engine encounters a sourcing rule for repair at a supplier site, it recommends various planned orders, which when implemented translate into:

- External repair order: Purchase order for the repair supplier

- Defective inbound shipment: Internal requisition at the repair supplier
- Defective outbound shipment: Internal sales order to ship defectives to the repair supplier

In this process, one of the important requirements is to manage the inventory at the repair supplier site. The inbound inventory into the repair organization is due to the shipment of defectives from the defective subinventory of the central or defective warehouse. This material needs to be manually received into the default subinventory at the repair supplier organization.

In case of deviations from the norm, the actual repair yields must be managed manually. For example, the yield is defined as 50%. For a repair order, 100 units are repaired while the actual yield is only 10%. Then the purchase order needs to be reduced by 40 units such that planning will net and generate the replenishment recommendation for the remaining 40 units.

The receipt of the good part in the warehouse against the repair purchase order triggers a back flush transaction to reduce the inventory in the repair supplier organization.

As mentioned previously, in SPP, planning generates three separate planned orders for the external repair:

- The planned order to repair that is implemented as a purchase order to repair defective parts by the repair supplier. This is the repair planned order.
- The planned order at the repair supplier organization that represents the actual repair work order at the repair supplier site. This is the planned repair work order.
- The planned order to move defectives to complete the preceding repair work order. This is the planned defective outbound or inbound shipment.

Service Parts Planning plans the parts to be repaired and the attributes of repair:

- The quantity expected after repair.
- The repair site, and defectives that are to be used for the repair.

The three planned orders are combined as one recommendation to Spares Management. Three separate kinds of recommendations can be generated for repair:

- Case I: New repair planned order for external supplier.
- Case II: One of the following changes to existing repair for external supplier
  - Only the repair planned order is new
  - Changes to purchase order dates, cancellation, reschedule in or out
- CASE III: Changes recommended only to upstream supply for external supplier

- Changes to nonstandard job dates, repair job planned order, transfer orders, or transfer planned orders

CASE III can be a result of SPP dynamic pegging or cross pegging.

The Spares API runs in two modes:

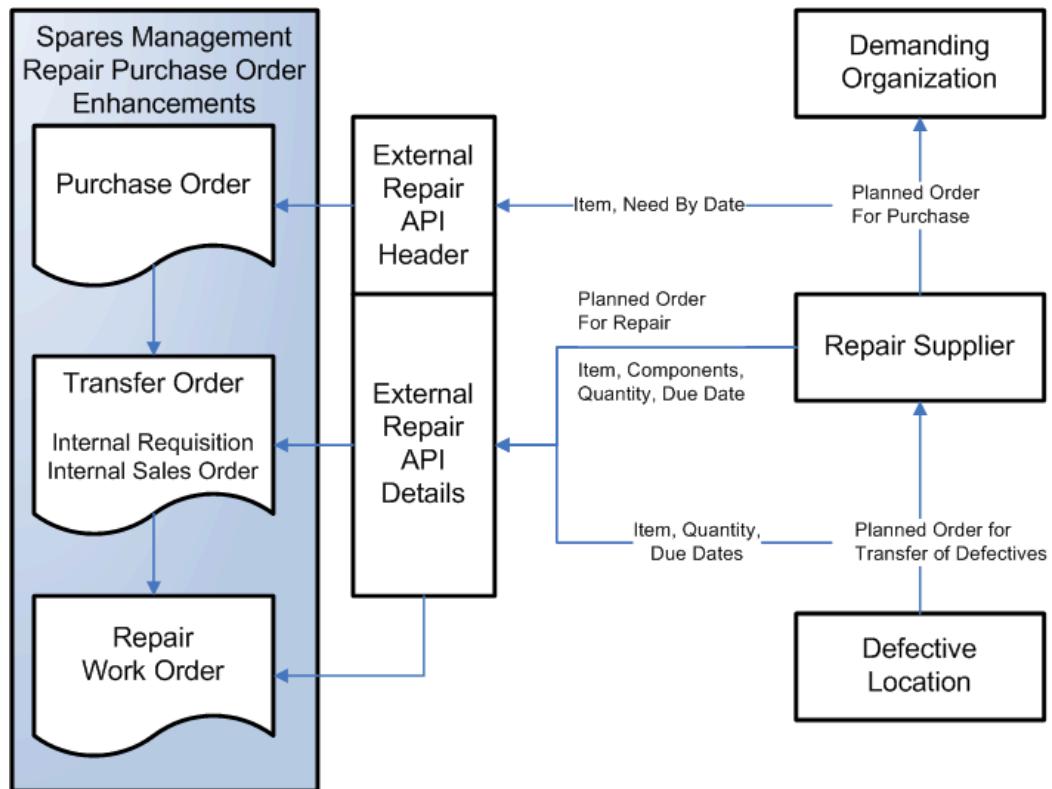
- Create new order mode
- Update existing order mode

To streamline the first two types of recommendations (Case I and Case II) from ASCP, external repair planning assumes the following:

1. From the Planner's Workbench, users can implement only the planned order that represents the purchase order for repair. (Repair planned order)
2. Planners cannot release any upstream supply related to the external supplier organization. This includes the repair job planned order and the transfer planned order to move defectives in the case of repair return - pull.
3. The Planning-Spares execution API includes these details for:
  - Header: The repair planned order with the item, quantity, need by date, dock date
  - Details: The details of the nonstandard job with the item, start and end date and the component required for the repair
  - Details: The details of the defective logistics, including item, quantity and source organization for the defectives.
4. Spares management generates the related defective movement orders based on planning recommendations as well as the repair work orders.
5. If any mismatch occurs in the upstream supply, such as nonstandard job quantity or the defective component requirements, planning recommends planned orders for them.

These orders cannot be released from planning. You must manually create these orders if they are feasible, or make appropriate changes to the purchase order.

6. If the orders are not feasible, planning generates an unmet demand exception and generates the related exception message saying that not enough defectives are available to complete the repair in time. Planners will then have to resolve the discrepancy by reducing the purchase order quantity.



## Consolidated Repair Purchase Order View in Spares Management

Repair Purchase Order Details							
Requisition	Date	Supplier	Repair Prog	FS Whse	Defective Whse	Auto PO	RMA
987654	12-APR-2004	Micro Electric Repair	Repair and Return	Repair and Return	Dallas Defectives	Yes or No	14267
Purchase Order							
Purchase Order	Date	Status	Date Shipped	Carrier	Waybill	Date Received	
674562	14-APR-2004	Approved					
Internal Order							
Internal Order	Date	Status	Date Shipped	Carrier	Waybill	Date received	
812408	14-APR-2004	Booked					
WIP Order							
WIP Order	Date	Status	Sched Start	Sched Complete			
Line No.	Defective Item	Repair To Item	Def Qty Ordered	Yield Rate	Repair To Qty	Need By Date	RMA
1	AS65101	AS65105	20		4	12-APR-2004	14267
2	AS65102	AS65105	50		25	12-APR-2004	14267
3	AS65103	AS65105	50		40	12-APR-2004	14267
4	AS65104	AS65105	100		90	12-APR-2004	14267
5		AS65105	220	.73	160	12-APR-2004	
6							
7							
8							
9							

Planning calls the Spares Management API with the release of the planned order related to the repair purchase order, and also pushes the details of the planned order for repair and movement of defectives to the repair supplier. Spares management automation and execution is triggered for the planned orders for repair.

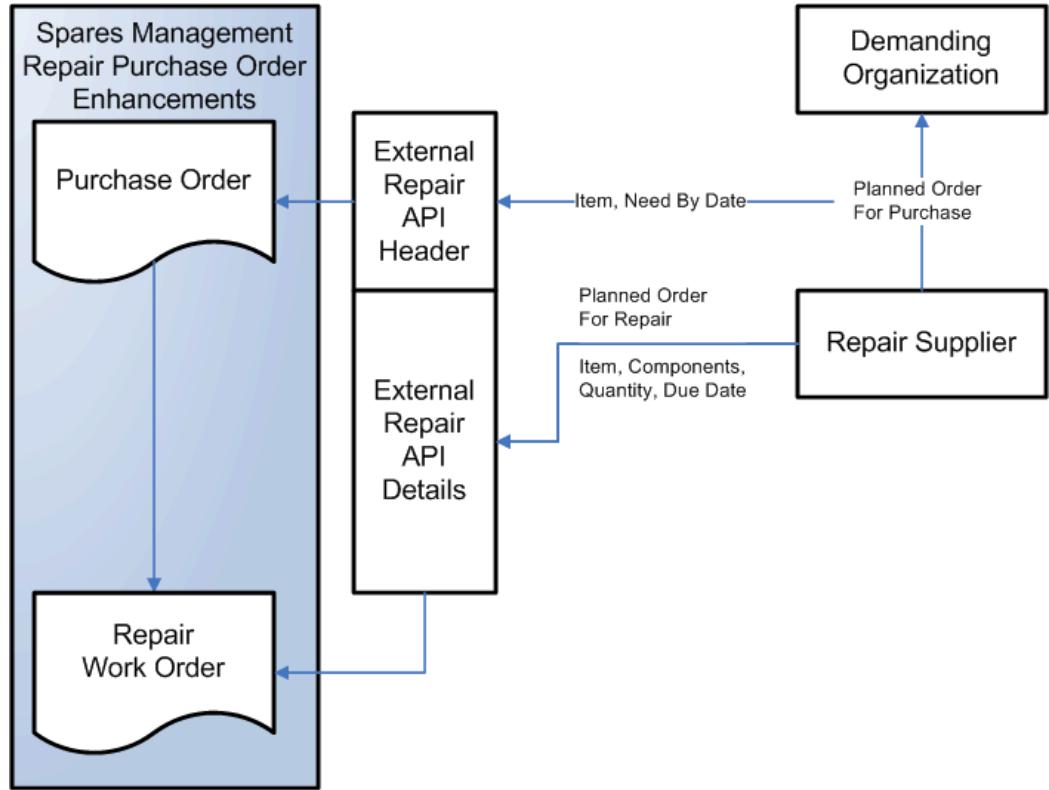
## Planning and Execution for Prepositioning

In terms of planning, no difference exists for cases in which the item is managed in a preposition relationship. The only functional difference is that the transfer of defective material to the repair supplier is independent of raising the purchase order.

A limit to the amount of defective inventory that the repair supplier is willing to carry may also exist. Those limits are governed by contractual agreements. The ability for planning to push all defectives to a preposition point is not implemented in the initial release.

The item organization attribute Prepositioning point defines the supply chain node to which upstream supply for that item is pushed. This ensures that all the defective item on-hand inventory is pushed to the repair supplier organization in the case of push or prepositioning the defectives at the supplier site. Planning does not create recommendations pulling in inventory.

Planning generates planned orders to move material for repair and also to move material from the repair supplier. Because the inventory is prepositioned, planning implements planned orders related to the repair purchase order, and additionally sends details of the planned orders related to the repair at the repair supplier organization (nonstandard repair work order).



## Planning and Execution for Depot Repair

The planning engine not only plans the movement of material (usable parts from depot repair to demanding organization and the defectives from the defective warehouse to the depot repair) but also plans the repair work order.

Because the repair depot is defined and modeled as a separate organization in the supply chain, the planning engine generates the correct move recommendations, (internal sales orders and internal requisitions) to move the defective and the usable parts from and into the repair depot.

To plan for the repair work orders, the planning engine considers the depot repair work order and the relevant bills of material and routings. The engine also derives the correct defectives that go into the particular repair work order depending on the repair capability and supersession chain.

To perform the resource planning, routings must be defined.

The planning engine generates planned orders for the movement (into the repair depot

and from the repair depot) and the repair work order. The Supply Chain Planning profile option *MSC: Enable concurrent release of related orders* determines whether the three related orders need to be implemented one at a time or simultaneously. When this profile option is enabled, the release of one order automatically triggers release of the other two related planned orders.

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# Inventory Parts Planning

This chapter covers the following topics:

- Overview
- Safety Stock Calculations
- Default Rules for Considering Safety Stock
- Evaluation of Multiple Service Levels Specified on Different Forms
- Inventory Optimization and Service Parts Planning

## Overview

The Oracle E-Business Suite considers inventory levels and prescribes safety stock levels across the service supply chain, including field service technicians. You can specify the maximum inventory and target inventory in terms of days of supply on the Distribution Planning region of the MPS/MRP Planning tab of the Organization Items form.

## Safety Stock Calculations

Service planning supports the following methods of safety stock calculations:

- Safety stock based on item attributes
- Safety stock recommended by Inventory Optimization

The safety stock calculation method that is based on item attributes has two options:

- MRP Planned Percent
- Non MRP Planned Percent

**MRP Planned Percent.** If you choose the MRP planned percent method, then safety stock for the item is dynamically calculated during the planning process. The safety stock quantity is calculated by multiplying the safety stock percentage you define by the

average of gross requirements for a period of time defined by the safety stock days.

Safety Stock = Safety Stock Percent \* (Gross Requirements / Safety Stock Days)

**Non MRP Planned.** When this item attribute is used, the safety stock value is defined by Oracle Inventory.

Oracle Inventory provides several methods for calculating safety stock. The safety stock values are collected from the source instance. If no safety stock is defined in Oracle Inventory, then safety stock is zero.

**Inventory Optimization Recommended Safety Stock.** If you choose to run safety stock based on Inventory planning, then to determine the safety stock service planning uses the Inventory Optimization plan that is fed as a demand schedule.

Inventory Optimization recommends the safety stock both in days of supply and quantity. Based on the plan option in Service Planning, you can specify whether to use Days of Supply or Quantity as the safety stock level calculation method.

Because SPP inline forecasting generates forecasts for the highest revision in a supersession chain (except if the planner defines failure rates for lower revisions), Inventory Optimization also considers setups for the highest revision in the supersession chain, and prescribes the policies at the highest revision in the supersession chain. In case Oracle Demand Planning or Oracle Demantra Demand Management is used for forecasting, the user sets the supersession product introductions appropriately so as to ensure that the forecast is for the highest revision.

## Safety Stock Calculation Supports Supersession

Planning logic considers the forecast, sales order, and safety stock demand as part of the supersession substitution calculation.

The system supports the case in which safety stock demand exists on the latest revision item while supply exists on an earlier revision that can be substituted in a bilateral relationship. Planning considers the existing supply prior to generating a new recommendation to create supply either through repair or new buy.

The site level profile option for safety stock calculation *MSC: (Service Planning) Item safety stock level value* determines the safety stock consideration in SPP. If the value for this profile option is Item, then SPP considers the safety stock level for each item (for which safety stock is prescribed) and does not substitute or use up supply from substitutable parts. If the value for this profile option is set to Prime, then the safety stock for the entire prime is considered as the safety stock level. The existing supply for the various members of the prime is considered while trying to maintain the safety stock level.

## Default Rules for Considering Safety Stock

1. When the safety stock level for a group of items is provided by Inventory Optimization, disregard the item attribute safety stock (safety stock based on MRP

planned percentage) for the entire supersession chain.

For example, A -> A1 -> A2 -> A3 (where A3 is the current version) and Inventory Optimization recommends a safety stock level for item A3. Then disregard it even if safety stock item attribute exists for A, A1, A2. This assumes the profile MSC: (Service Planning) Item safety stock level value is set to 'Prime'. This could also include user defined safety stock for a superseded part, in which case Inventory Optimization prescribes the safety stock level for the latest revision item but also includes the safety stock level for the superseded part that the user has prescribed.

2. When the Inventory Optimization plan does not recommend the safety stock for a supersession chain, aggregate the safety stock level for the items based on the MSC: (Service Planning) item safety stock level value and the safety stock prescribed for each item. This safety stock can be prescribed in inventory or calculated by planning as MRP planned percentage for each SKU.

### **Example**

For example, A3 -> A4 <-> A5 <-> A6 -> A7 <-> A8

Assume that the safety stock level for each of these items is 100 units for a given period.

- If the profile option MSC: (Service Planning) item safety stock level value is set to Item then consider the safety stock level for each item to be 100 units, and then use only native supply to maintain this level. Hence no substitution will be recommended by planning. The safety stock violation exceptions are raised for each item.
- If the profile option MSC: (Service Planning) item safety stock level value is set to Prime, then planning determines that A3, A6 and A8 are the primes in this supersession chain. Then planning uses the following levels:
  - For A3 100 units -> and planning will only use supply of A3 to maintain this level
  - For A6 300 units -> and planning will use supplies of A4, A5 and A6 to maintain this level.
  - For A8 200 units -> and planning will use supplies of A7 and A8 to maintain this level.

**Note:** The safety stock level for the supersession items is not pushed to the latest supersession part. The safety stock levels as defined by the users as per the above rules are honored. Oracle recommends that you change (or delete) the item attributes or user defined safety stock levels for superseded parts as part of the change process when including a new supersession part in the chain.

The recommended setup for the MSC: (Service Planning) item safety stock level value is Prime, in which case the Projected Available Balance (PAB) will be accurate when you are viewing the supply chain with the item aggregation level of Prime.

## Calculating Target and Maximum Safety Stock

The Maximum and Target levels are also calculated for parts for which the safety stock is considered.

## Safety Stock as Days of Supply

When the safety stock is specified as Days of Supply, planning calculates the safety stock demand across the supply chain by considering the same demand across the primary supply chain path, and then calculating the safety stock numbers at those organizations. This is achieved by generating an unconstrained demand plan through the primary path.

The service planning user interface displays the safety stock quantity, the unconstrained demand used by service planning for safety stock calculations, and the safety stock days of supply number when applicable for the part.

## Safety Stock Smoothing When Using Days of Supply

In the case of MRP Planned Safety Stock, Service planning uses a safety stock smoothing technique to eliminate the dramatic variations in safety stock levels within a time period specified by the user. This typically occurs when the forecasting and planning buckets are in days and the safety stock is specified as Days of Supply.

The safety stock smoothing will use the following profile options to calculate the smoothing:

Profile Name	Description
MSC : Safety stock change interval (Days)	This is the time interval used for the smoothing within time interval functionality. If you specify an interval of 20 days, then starting from the system date, planning groups the safety stock calculation in 20 day buckets. Planning then uses the MSC: Smoothing method to calculate the safety stock within change interval to determine the safety stock level for the bucket.

Profile Name	Description
MSC: Smoothing method to calculate safety stock within change interval	Specifies the mathematical construct used to calculate safety stock for a time interval using values within the time interval. The values are minimum, maximum, and average. Planning uses the minimum safety stock level, or the maximum safety stock level, or calculates an average within the MSC: Safety stock change interval (Days) to determine the safety stock level for that period.
MSC: Maximum Percentage variation in safety stock values	The safety stock is not allowed to deviate by more than this value when going from one time interval to the next.
MSC: Minimum Percentage variation in safety stock values	The safety stock is held constant across time intervals if the deviation is within this percentage

Further, only a single safety stock is provided for the entire horizon for low volume demand (determined based on the selection of Croston's method of forecasting).

## Evaluation of Multiple Service Levels Specified on Different Forms

Service levels can be specified:

- At the plan level
- In item simulation sets
- In service level sets

Different service levels apply according to the following rules:

1. A service level specified in the Plan Options form (and enforced by selecting the Enforce Plan Level defaults check box) overrides any other value. If this rule is not enforced, then this service level serves as the default value for items where service level is not set by any other means.
2. If the service level is not enforced through Plan Level defaults, and if the service level for an item- and organization combination is specified in the item simulation set, then the value from the item simulation set applies for the plan run.
3. If the service level is not enforced through Plan Level defaults, and no service level is set in the item simulation set, but service levels are set using the service level set, then the service levels from the service level set are used in the plan run.

A specific hierarchy exists in which service level values default in Oracle Inventory Optimization if entered as part of the service level set. In general, if service level is not

provided at a lower level, then the logic checks for service-level default values from higher (more general) levels. For example, service level is not provided at the demand class level. Then logic looks in category, and then item-instance-organization level, and so on.

If service levels are specified at lower levels, then Inventory Optimization logic picks up service level from those lower levels. The only exception to this rule is when you use plan level enforcement. If you specify the service level in plan options (plan level enforcement), Oracle Inventory Optimization logic always uses the service level from plan option, even if service levels are specified at lower levels using a service level set.

The following matrix helps explain the service levels considered by the planning engine as applicable when service levels are enforced (ESL). Note that in plans that enforce capacity constraints (ECC), or enforce budget constraints (EBC), the service level achieved is an *output* of the plan rather than an *input*.

Service level entered at plan option (Plan level defaults)	Enforce plan level default	Service levels specified in item simulation set	Service levels entered using service level set	Expected behavior
Yes	Yes	Yes or No	Yes or No	Service level requirement for all the demands is taken from service level that you enter in at plan option.
Yes	No	Yes	Yes or No	The service level requirement is picked up from the item simulation set, if specified there, or from collected data. If service level is not available from those sources, then the value set in the service level set is used. If none are available then the value set for plan level defaults are used.
Yes	No	No	Yes	The service level that you specify in the service level set will be used. If no service level can be inferred for an item, then plan level defaults are used.

Service level entered at plan option (Plan level defaults)	Enforce plan level default	Service levels specified in item simulation set	Service levels entered using service level set	Expected behavior
No (Null)	No	Yes	Yes or No	<p>the service level requirement is inferred from the item simulation set. If no service level can be inferred from the simulation set, then it is inferred from the service level set. If service levels cannot be inferred from service level set either, then a default service level of 50% is assumed.</p> <p><b>Note:</b> In EBC plans, the main task is to determine the achievable service levels given a budget. The service level to be achieved is not specified in this case (EBC plans). However, EBC plans require you to provide a target service level that needs to be achieved for all items in a plan; such target service level is entered at plan option. The default value for the target is considered to be 50%.</p>
No (Null)	No	No	Yes or No	Service levels specified in the service level Set are used. If none exist, then a default target service level of 50% is assumed.
No (Null)	Yes	Yes	Yes or No	<p>The plan will use the service levels specified in the item simulation set or collected data. If nothing is specified in the simulation set, the service levels from the service level set are used.</p> <p>If none exist, then a default service level of 50% is assumed.</p>
No (Null)	No	No	Yes	The plan will use the service levels specified in the service level set.

Service level entered at plan option (Plan level defaults)	Enforce plan level default	Service levels specified in item simulation set	Service levels entered using service level set	Expected behavior
No (Null)	No	No	No	The plan will interpret the service level requirement at 50%; that is, no safety stocks are calculated.

## Defaulting Service Levels

As mentioned previously, a specific hierarchy exists in which service levels are defaulted in Oracle Inventory Optimization if entered as part of a service level set. In general, if service level is not provided at a lower level, logic checks for defaulting service levels from the higher level. For example, if service level is not provided at demand class level, logic looks for category, item-instance-organization level, and so on.

If service levels are specified at lower levels, Inventory Optimization logic picks up service level from lower levels. The only exception to this rule is when you use plan-level enforcement. If you specify the service level in Plan Options (plan level enforcement), Oracle Inventory Optimization logic always picks up service level from the Plan Options, even if service levels are specified at lower levels using service level set.

## Inventory Optimization and Service Parts Planning

Field (technicians and locations) may carry a very large inventory. Technician warehouses can be planned, especially if you want to constrain your Inventory plan with inventory budgets. Some of the enhancements and considerations in Inventory Optimization (IO) to support the service parts business include:

- Demand fulfillment lead times (DFLT)
- Inventory planning for the supersession chain
- Support for Poisson's distribution for intermittent demand (and demand for small quantities)
- Safety stock smoothing – Improved heuristic for rounding in case of non-intermittent demand
- Budget constraints and the field technician trunk stock
- Item simulation set in plan options

See the *Oracle Inventory Optimization User Guide*.

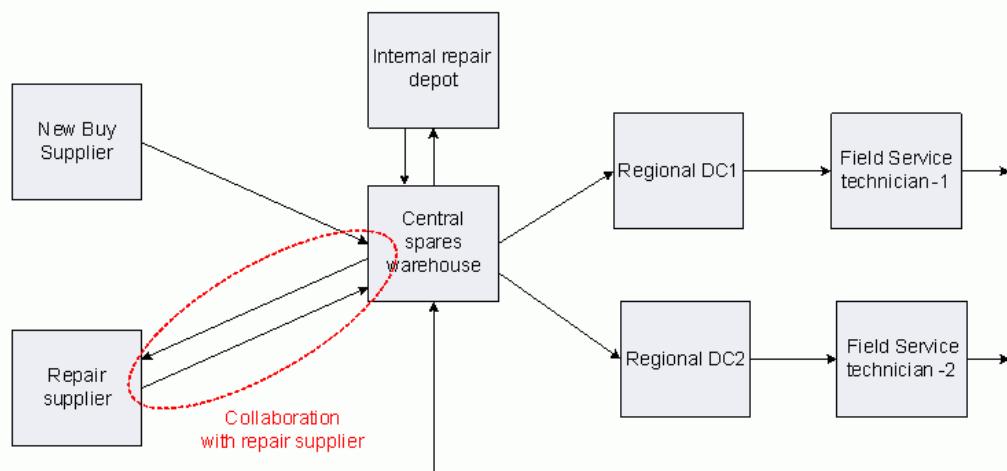


## Collaboration Planning

### Communicating with Other Members of the Supply Chain

Oracle Collaborative Planning allows the SPP Planner to share forecasts of expected defective or returned parts with repair vendors. This enables the vendor to proactively prepare its capability for responding to that demand, and to flag exceptions if necessary, which will then alert the planner to make corresponding modifications to the plan.

This diagram illustrates which relationship in the supply chain uses Collaborative Planning functionality.



### Using Collaborative Planning to Communicate with a Repair Supplier

The following example describes a scenario in which an OEM sends defective items to a Repair Supplier to be repaired to usable items.

The Returns Forecast for a particular period is 150 units, and the expected repair yield on these parts is 50 percent. The Service Organization expects to receive 75 repaired units back from the Repair Supplier, and this number is initially entered into the plan.

In the first stage of this scenario, the SPP Planner issues an Order Forecast, along with returns forecast information to the Repair Supplier, and requests that a confirmation (Supply Commit) be returned.

### Service Organization:

1. Log into the system.

**Sign In**

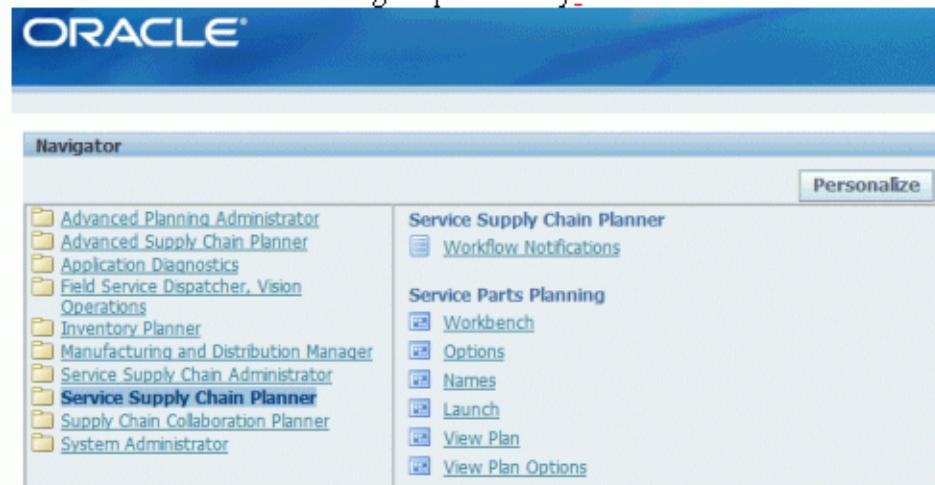
Enter your Single Sign-On user name and password to sign in

User Name

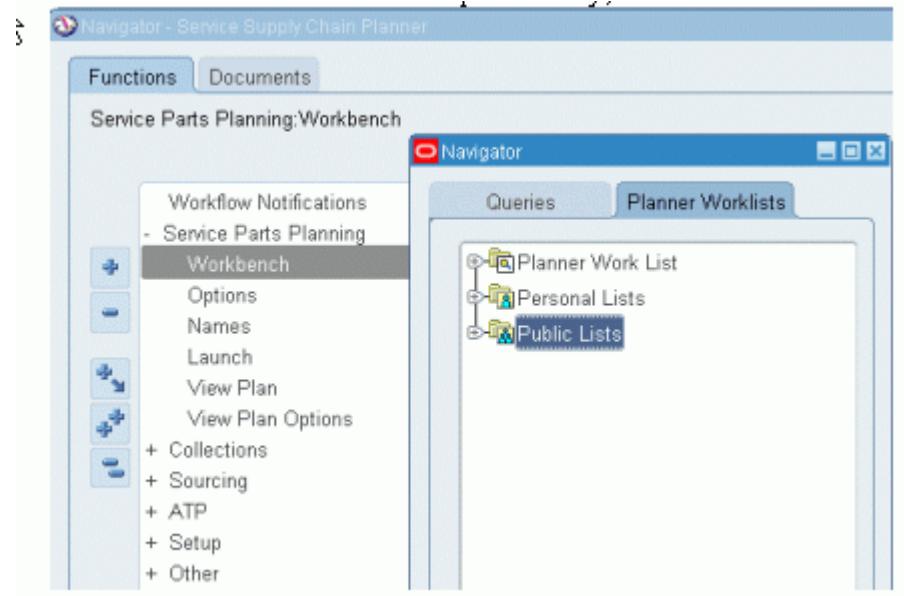
Password

Unauthorized use of this site is prohibited and may subject you to civil and criminal prosecution.

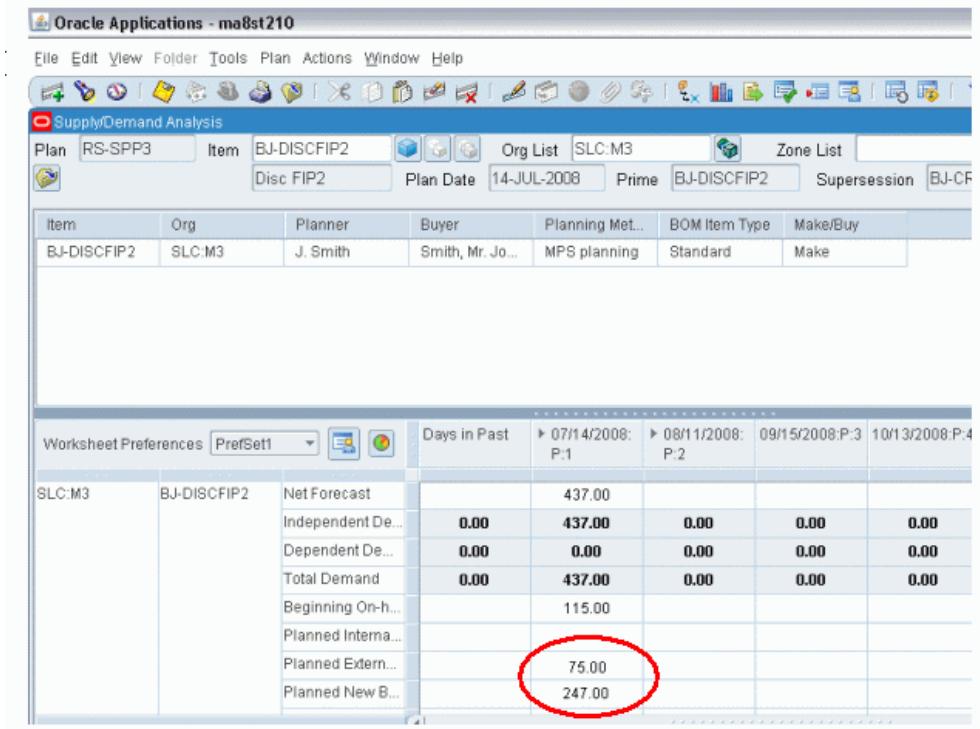
2. Choose the Service Planning responsibility.



3. From the Service Planners responsibility, choose Workbench.

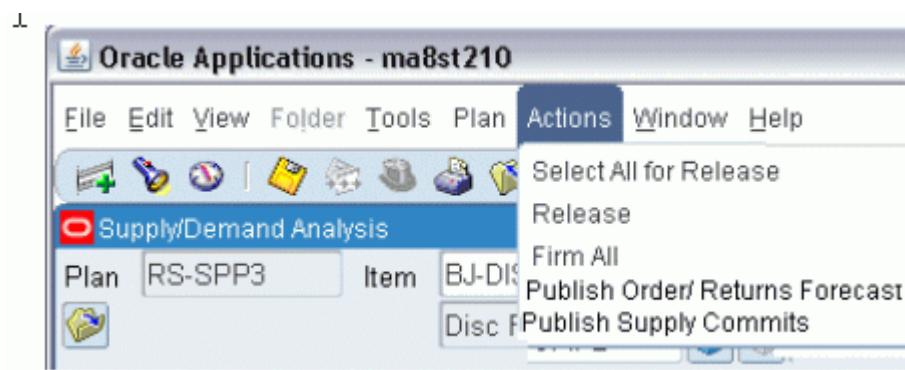


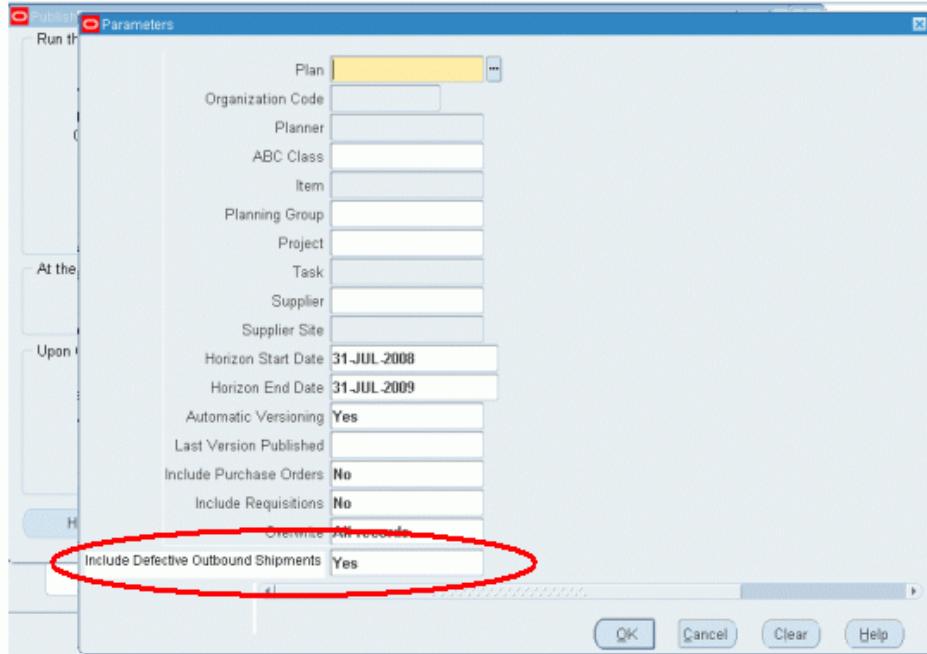
4. Open the Service Planning Workbench - Supply Demand Analysis page.



A service plan is generated that performs a repair versus new buy analysis and then recommends repair suppliers. The analysis is based on the returns forecast and the number of defective items in the supply chain.

5. As the SPP Planner, verify the plan, release the orders, and publish the order and the returns forecast to Collaborative Planning. To do so, select the menu item Actions Publish Order/Returns forecast. The forecast will be published to the Repair Supplier.





#### Notes

- Including Defective Outbound Shipments while publishing the Returns Forecast is optional.
- You cannot upload the Returns Forecast and Defective Outbound Shipments information through a flat file upload. This information can be exchanged only through the Publish Order>Returns Forecast concurrent program.
- Supersession revisions are not considered during Publish Order>Returns forecast, and information will be published as it is received.

#### Repair Supplier:

In the second stage of this scenario, the Repair Supplier receives notifications/exceptions that a new order forecast has been posted, and the Repair Supplier responds by completing the following steps:

1. Log into the system.

## Sign In

Enter your Single Sign-On user name and password to sign in

User Name	<input type="text"/>
Password	<input type="password"/>
<input type="button" value="Login"/> <input type="button" value="Cancel"/>	

Unauthorized use of this site is prohibited and may subject you to civil and criminal prosecution.

2. Choose the Supply Chain Collaboration Planner responsibility.

The screenshot shows the Oracle Navigator interface. At the top, there is a blue header bar with the word 'ORACLE' in white. Below the header is a 'Navigator' tab. The main area is divided into two columns. The left column, titled 'Navigator', contains a list of responsibilities with icons: Advanced Planning Administrator, Advanced Supply Chain Planner, Application Diagnostics, Field Service Dispatcher, Vision Operations, Inventory Planner, Manufacturing and Distribution Manager, Service Supply Chain Administrator, Service Supply Chain Planner, Supply Chain Collaboration Planner (which is bolded and highlighted in blue), and System Administrator. The right column, titled 'Collaborative Planning', contains a single link: 'Home' with a document icon.

3. Verify the order forecast and returns forecast that was published by the Planner.

Select Item	Item Description	Customer Site	Supplier Site	Order Type	Actual Date	Quantity	Commit Owner
<input type="checkbox"/> BJ-DIBCFP2	Disc FIP	SLC-M3	Advance Network	Order Forecast	14-Jul-2008	75	Vision Corporation
<input type="checkbox"/> BJ-DIBCFP2	Disc FIP	SLC-DWH	Advance Network	Returns Forecast	10-Jul-2008	150	Vision Corporation

4. Verify the returns forecast stream and commit the order forecast. The Repair Supplier recognizes that the incoming supply is 150 units and the order forecast is for 75 good units. Lately, however, this part has had an average yield of only 40 percent, not 50 percent, so the Repair Supplier is unable to commit to producing 75 units. The Commit is made for only 60 units.

Select Item	Item Description	Customer Site	Supplier Site	Order Type	Actual Date	Quantity	Document Owner	
<input type="checkbox"/> BU-DISCFIP2	Disc FIP	Vision Corporation	SLC-M3 Advance Network	Santa Clara	Order Forecast	14-Jul-2008	75	Vision Corporation
<input type="checkbox"/> BU-DISCFIP2	Disc FIP	Vision Corporation	SLC-M3 Advance Network	Santa Clara	Supply Commit	10-Jul-2008	60	Vision Corporation
<input type="checkbox"/> BU-DISCFIP2	Disc FIP	Vision Corporation	SLC-DANH Advance Network	Santa Clara	Returns Forecast	10-Jul-2008	150	Vision Corporation

Collaborative Planning raises an exception, and the Service Organization planner is notified by email about the order commit from this supplier.

### Service Organization:

In the third stage of this scenario, the SPP Planner is alerted of the exception and modifies the plan as follows:

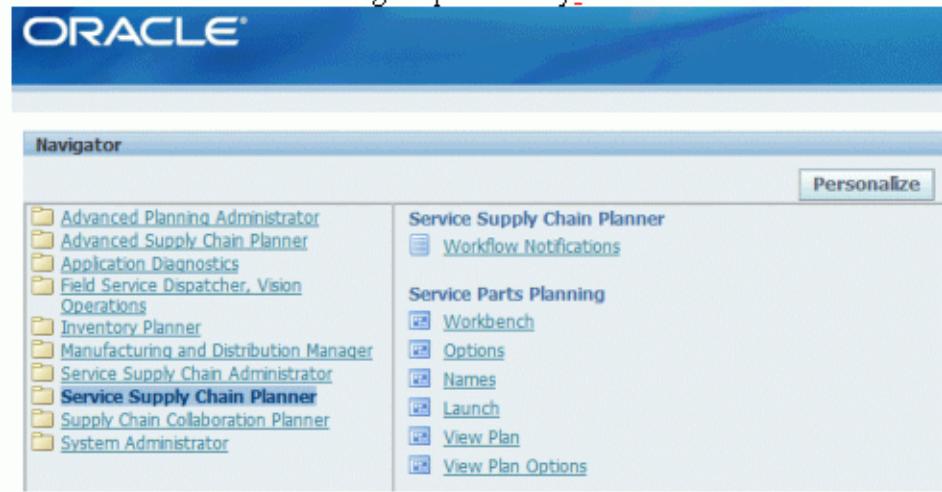
1. Log into the system.

[Sign In](#)

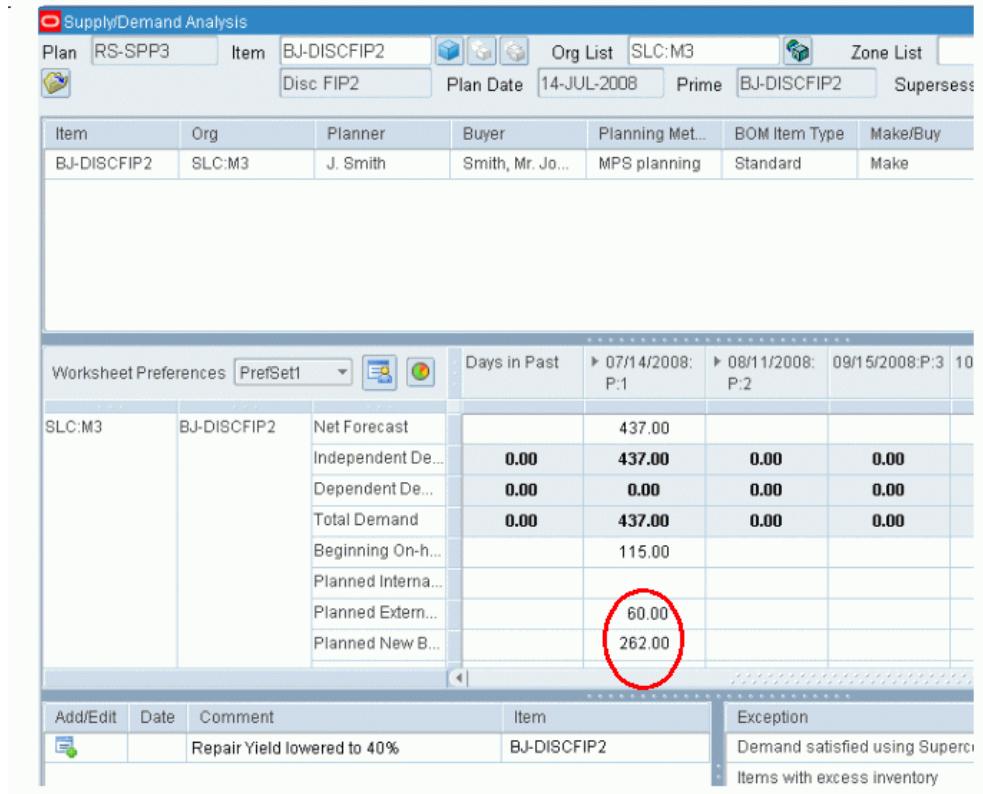
Enter your Single Sign-On user name and password to sign in

User Name	<input type="text"/>
Password	<input type="password"/>
<a href="#">Login</a> <a href="#">Cancel</a>	
Unauthorized use of this site is prohibited and may subject you to civil and criminal prosecution.	

2. Choose the Supply Chain Collaboration Planner responsibility.



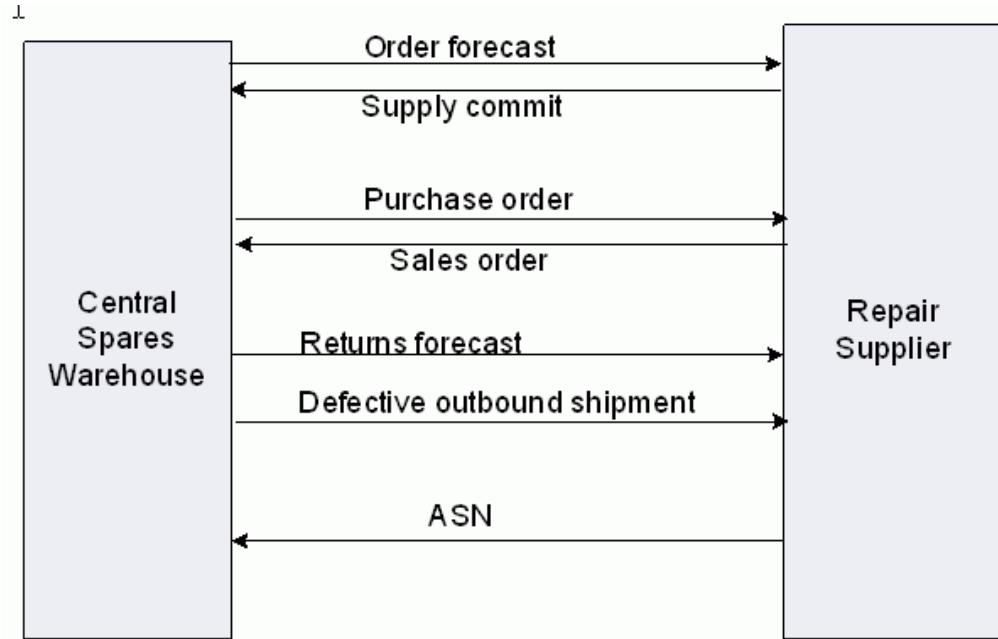
3. 3. Collaborative Planning raised an exception because the committed quantity is less in July 2008. Check the exception and verify the reason. The comment by supplier while committing refers to yield issues.
4. 4. The planner makes a change in the item simulation set and computes the plan again. The yield numbers are reduced, and the plan is relaunched.



5. The planner checks with the item planner/manager and buyer about making the change permanent in the item attribute.

In this case, the Order forecast that is published from this SPP plan run would be modified, assuming that no more defective items are available for repair.

## Message Flows



Collaboration with a Repair Supplier is similar to collaboration with a new supplier, but more data and documents must be shared. The following diagram illustrates the flow of messages that for the previous scenario between the Service Organization and the Repair Supplier.

This table describes the key documents in the previous collaboration:

Document	Description
Order Forecast	Statement of demand for the repair
Supply Commit	Statement of supply, a response to the Order Forecast
Purchase Order (PO)	Purchase order specifying the repair terms and conditions
Sales Order	Optional response to the purchase order
Returns Forecast	Statement specifying the expected future returns to the Repair Supplier, including forecast, shipments, and in-transit material

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Defective Outbound Shipment (DOS)	Optional stream that includes the near-term shipments (material yet to be shipped, already shipped, and in-transit)(This data is informational and is based on open ISOs.)
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# Glossary

**Depot Repair**

An organization in your supply chain that repairs or refurbishes products and parts.

**Emergency stocking locations (ESL)**

An organization from which inventories for a group of technicians are replenished.

**Inline Forecasting**

Generating forecasts within SRP as contrasted with using demand planning or ERP system to generate forecasts.

**Operational Data Store (ODS)**

Collected data is the data from the source ERP or legacy applications. Each plan run uses the ODS or collected data and then creates a plan-specific copy for most of the data.

**Planning Data Store (PDS)**

The data against each plan.

**Repair Lead Time**

The time needed to repair a defective part. This is the total of:

- Lead time to transfer defectives for repair
- Lead time to repair at the repair organization
- Lead time to transfer and receive usable parts from the repair organization

**Repair Supplier**

A third-party supplier in your supply base that provides repair and refurbishment-related services.

**Repaired, Refurbished, and Remanufactured Items**

Though these terms are almost interchangeable, this document assumes the following

definitions for repaired, refurbished, and remanufactured items in the context of a manufacturing organization. For a purely service-centric organization, these three terms share the same definition, which is: "The process of repairing and reusing spares or products to satisfy demand." All of these methods can include upgrades or downgrades of a product or part.

- Repair: An item received from a customer or as part of the defective returns from the field is processed, using additional resources and parts, to make the item functional and conform to original (or repaired) specifications. The product or part may be under warranty. Repaired parts are returned to the originating customer or field source.
- Refurbish: An item received either from a customer as an exchange item (where the defective item is exchanged for a good item) or other collection method such as defective and end-of-life returns, is processed, using additional processes and parts to conform to original product specifications. Such products or parts are then sold through normal distribution channel either as new products or refurbished products.
- Remanufacture: This mass refurbishment activity implies a higher value-add to repaired parts and products that are sold through the normal distribution channels, mostly as new products.

### **Returns Forecast**

A forecast of anticipated returns from the customer base, including end customers, distributors, and retailers for repair as well as end-of-life returns and collections.

### **Returns Forecast Time Fence**

An item attribute that defines a rolling period of time from the present to a point in the future, such as ten days. This attribute controls planning calculations so that the system considers returns forecast quantities for dates that are beyond this time fence, but only actual RMA returns within this time fence.

### **Returns Order Type**

When a forecast scenario is entered to a service plan as a supply schedule, the resulting supply is defined as Returns. The supply type of returns is available in the planner's workbench.

### **Reverse Logistics**

The broad definition of reverse logistics covers the management, planning, and execution of returns into an organization, and the processes of repair (refurbishment, or remanufacture), warranty, and reuse or scrapping the material.

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