



C2M.v2.7.MDM

4.2.2.1 MDM Calculate Usage

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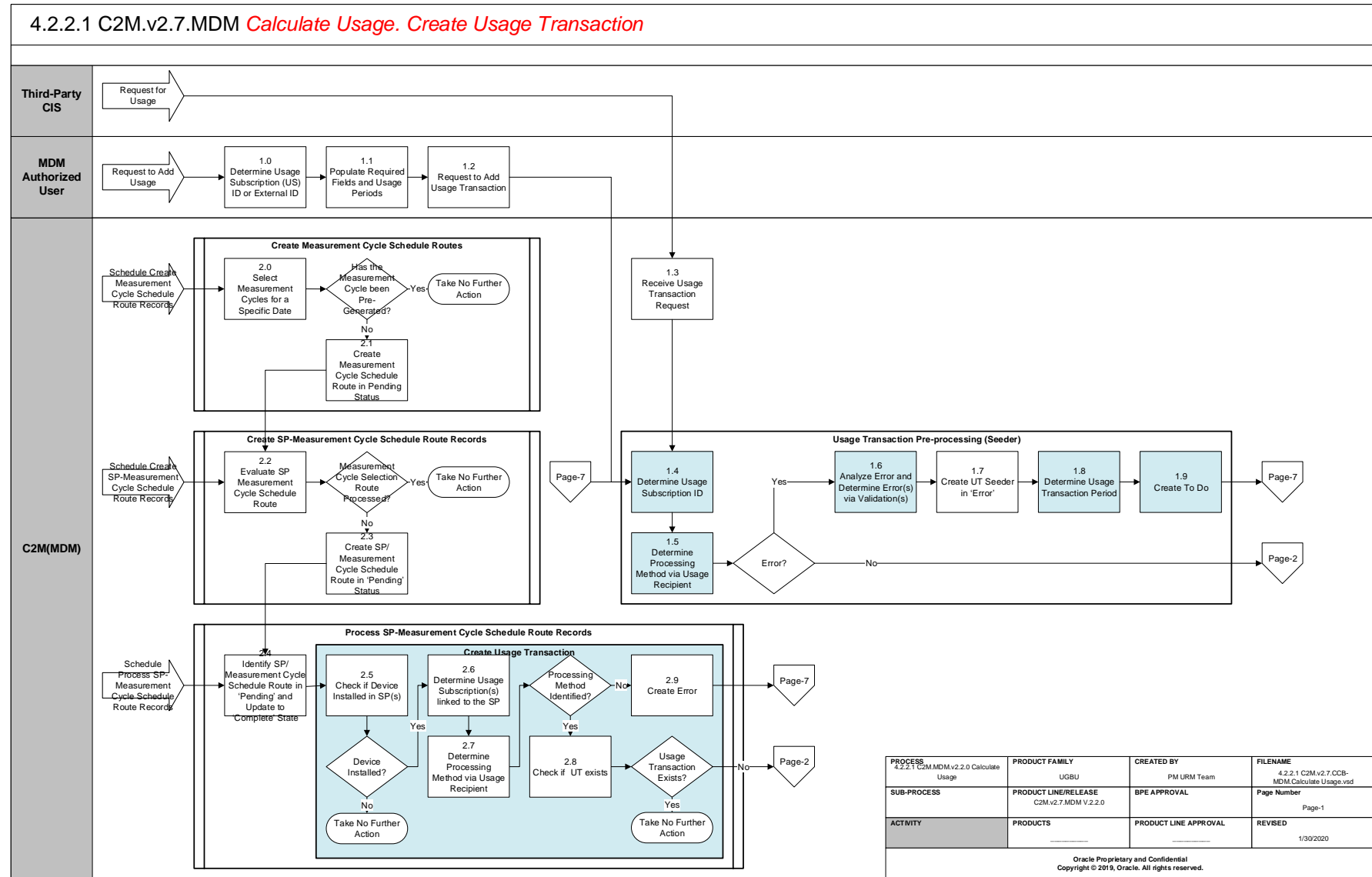
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Brief Description

Business Process: 4.2.2.1 C2M.MDM.Calculate Usage
Process Type: Sub-Process
Parent Process: 4.2.2 C2M.MDM.Manage Bill
Sibling Processes: N/A

This process is initiated when a Usage Transaction is created either manually by the user, automatically based on a measurement cycle, or ad hoc by a request from an external application. C2M(MDM) calculates usage for Usage Subscribers based on [Usage rules](#) defined in Usage Group(s) that are active during the required usage period. If more than one Usage Group is active during the period then a Sub Usage Transaction will be created for each of the active periods. Once the calculations for the Usage Transaction have been successfully completed then the results are sent to the Usage Recipient either online or by a scheduled batch process.

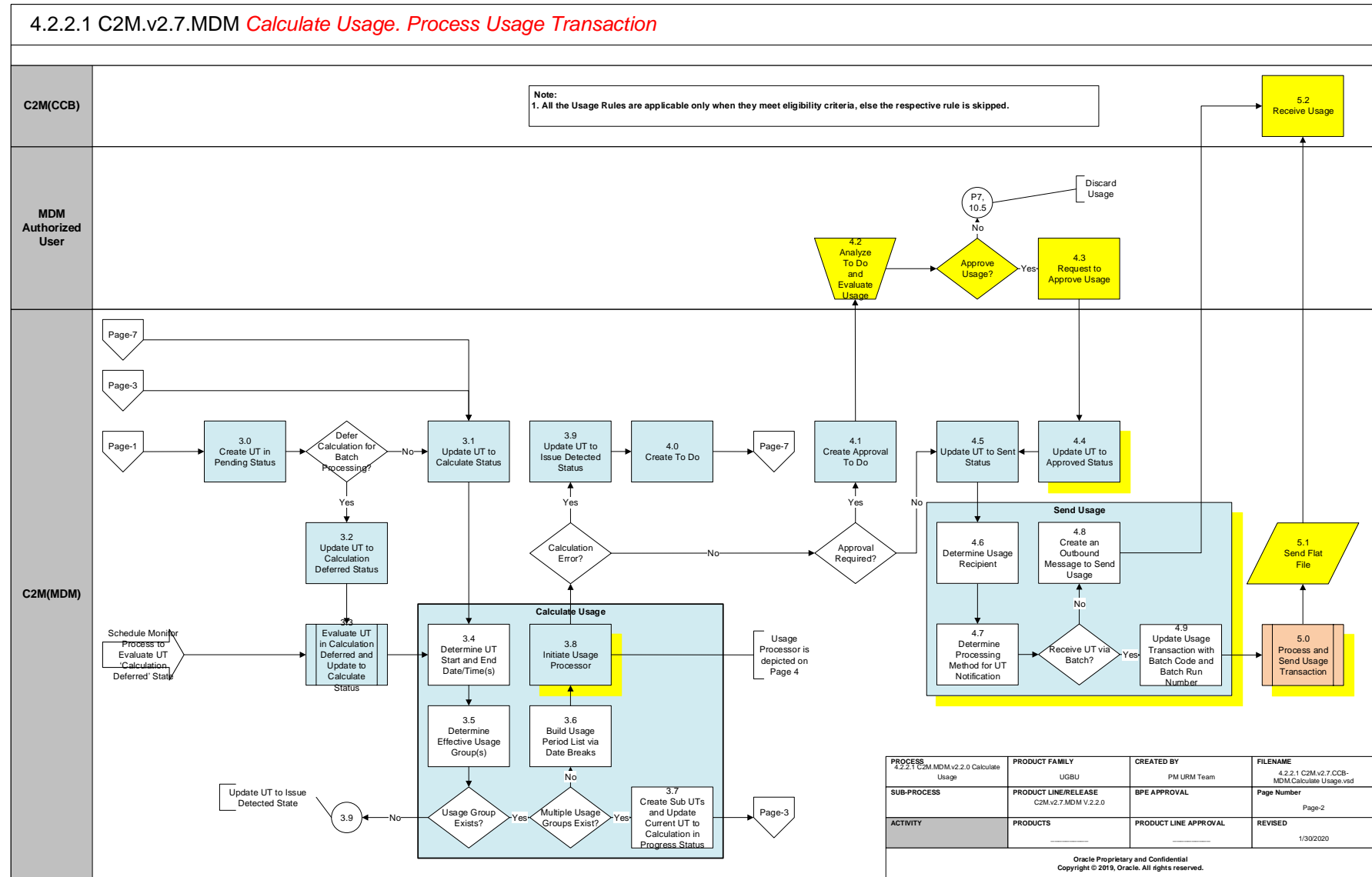
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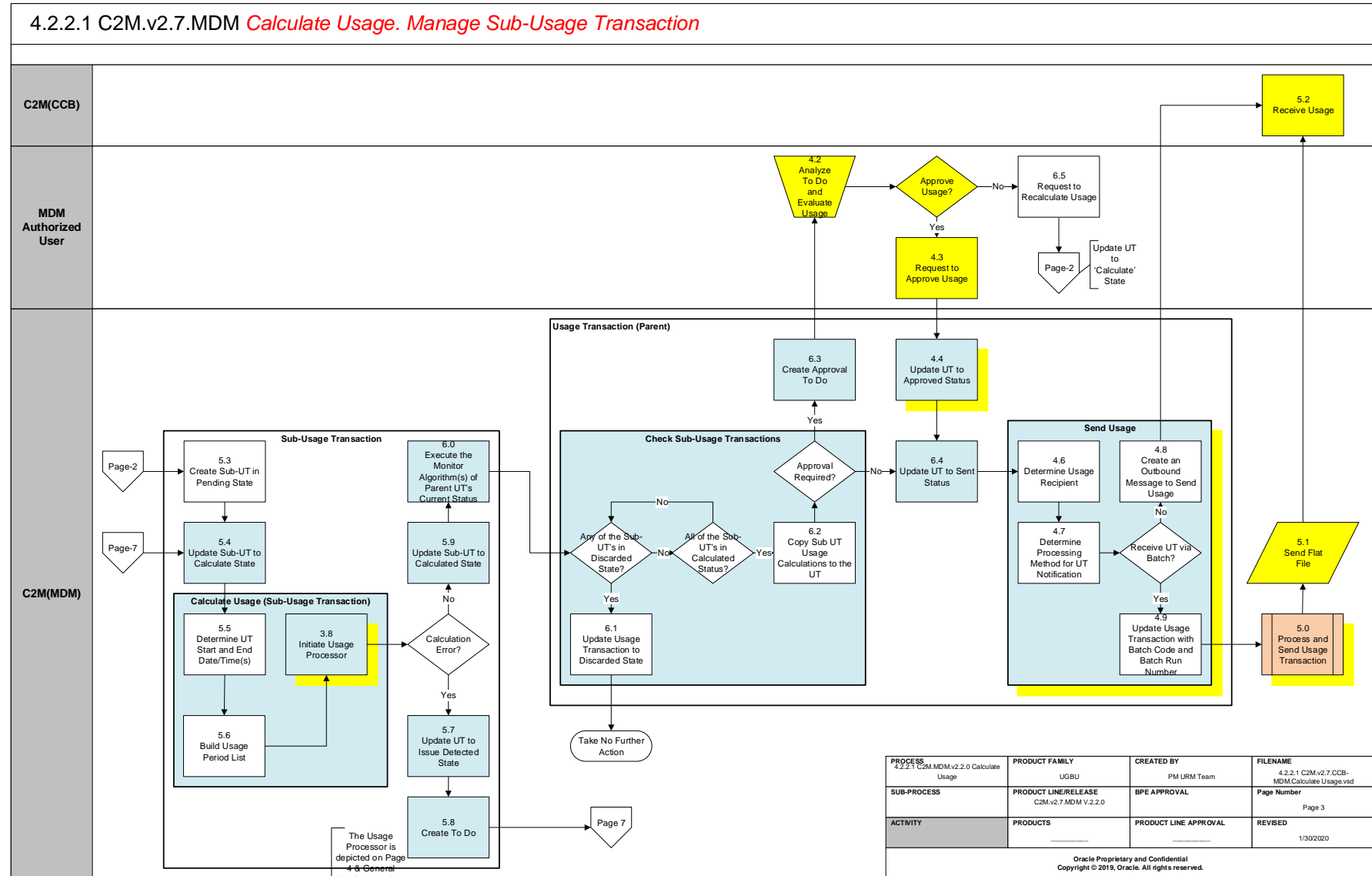
PROCESS 4.2.2.1 C2M.v2.7.MDM.v2.2.0 Calculate Usage	PRODUCT FAMILY UGBU	CREATED BY PM URM Team	FILENAME 4.2.2.1 C2M.v2.7.CCB-MDM.Calculate Usage.vsd
SUB-PROCESS	PRODUCT LINE/RELEASE C2M.v2.7.MDM V.2.2.0	BPE APPROVAL	Page Number Page-1
ACTIVITY	PRODUCTS	PRODUCT LINE APPROVAL	REVISED 1/30/2020

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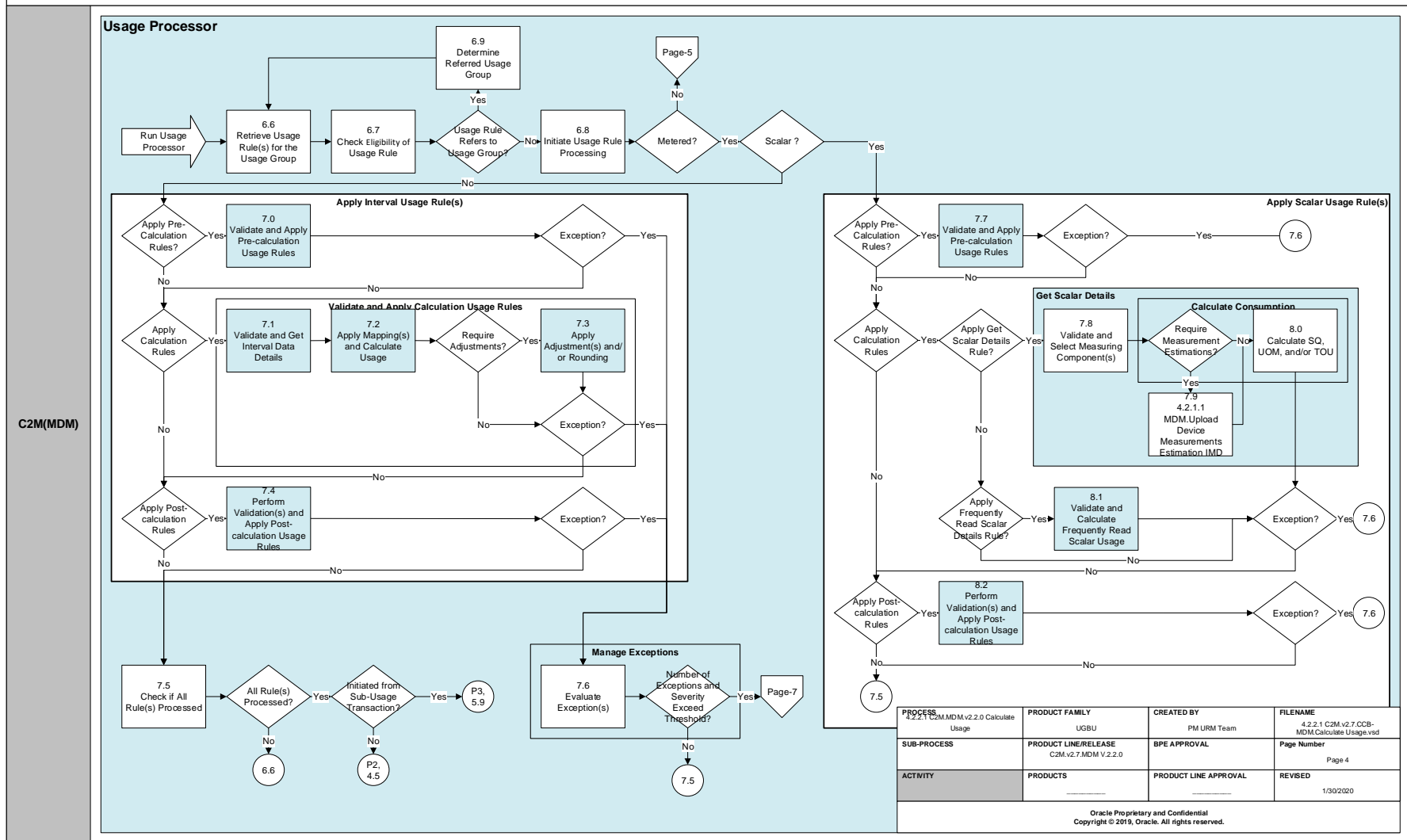


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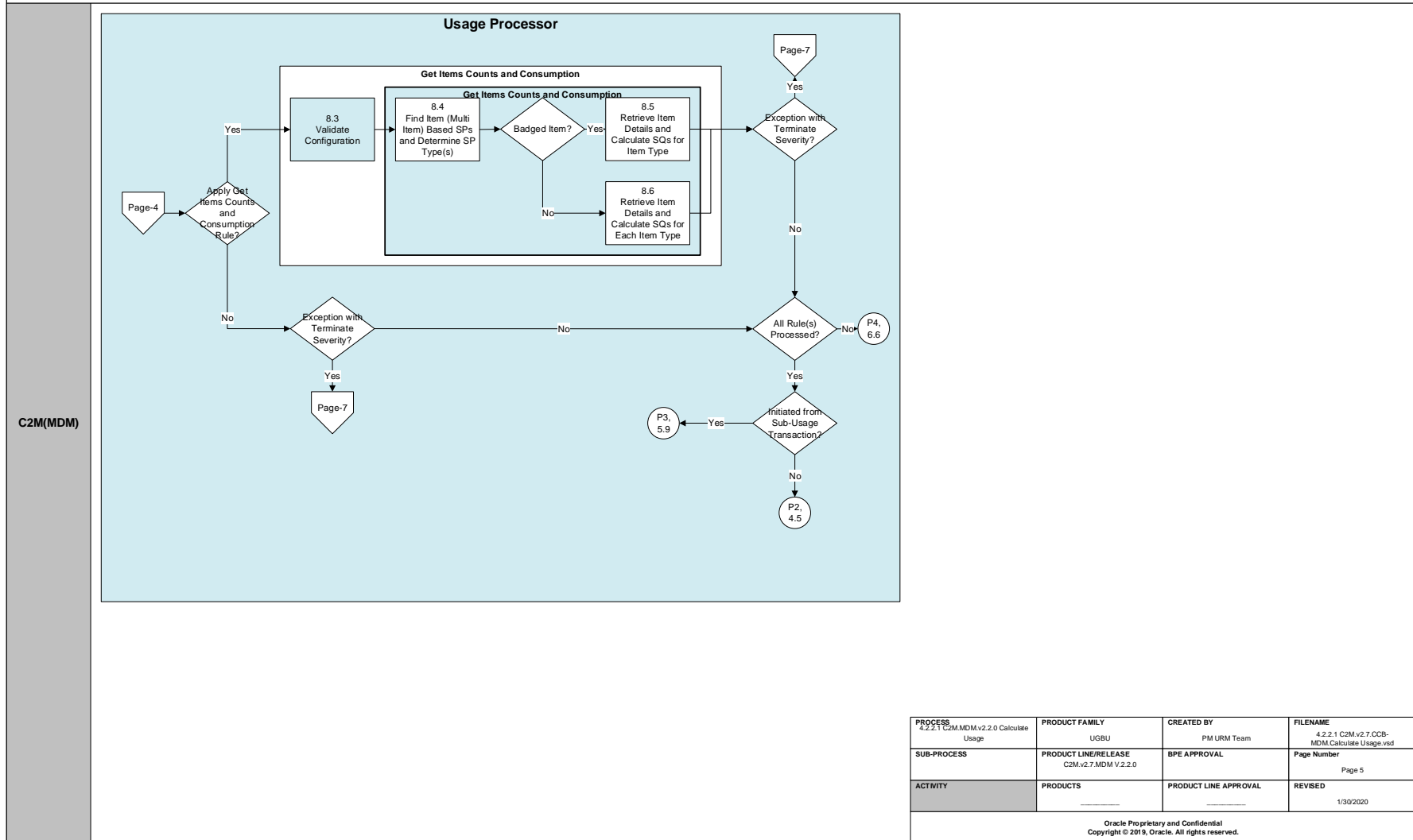
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4.2.2.1 C2M.v2.7.MDM Calculate Usage. Usage Processor

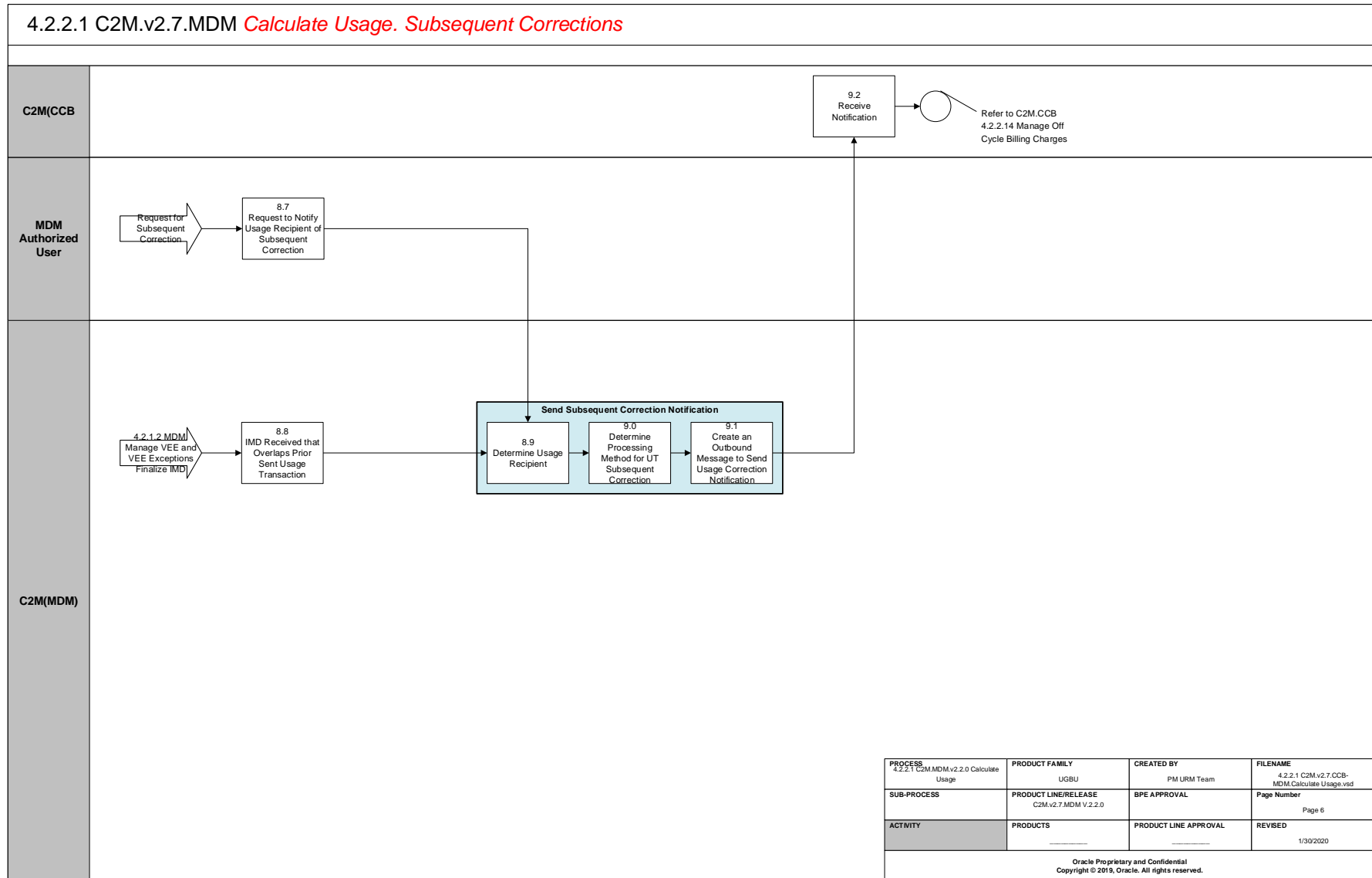


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4.2.2.1 C2M.v2.7.MDM *Calculate Usage. Usage Processor*

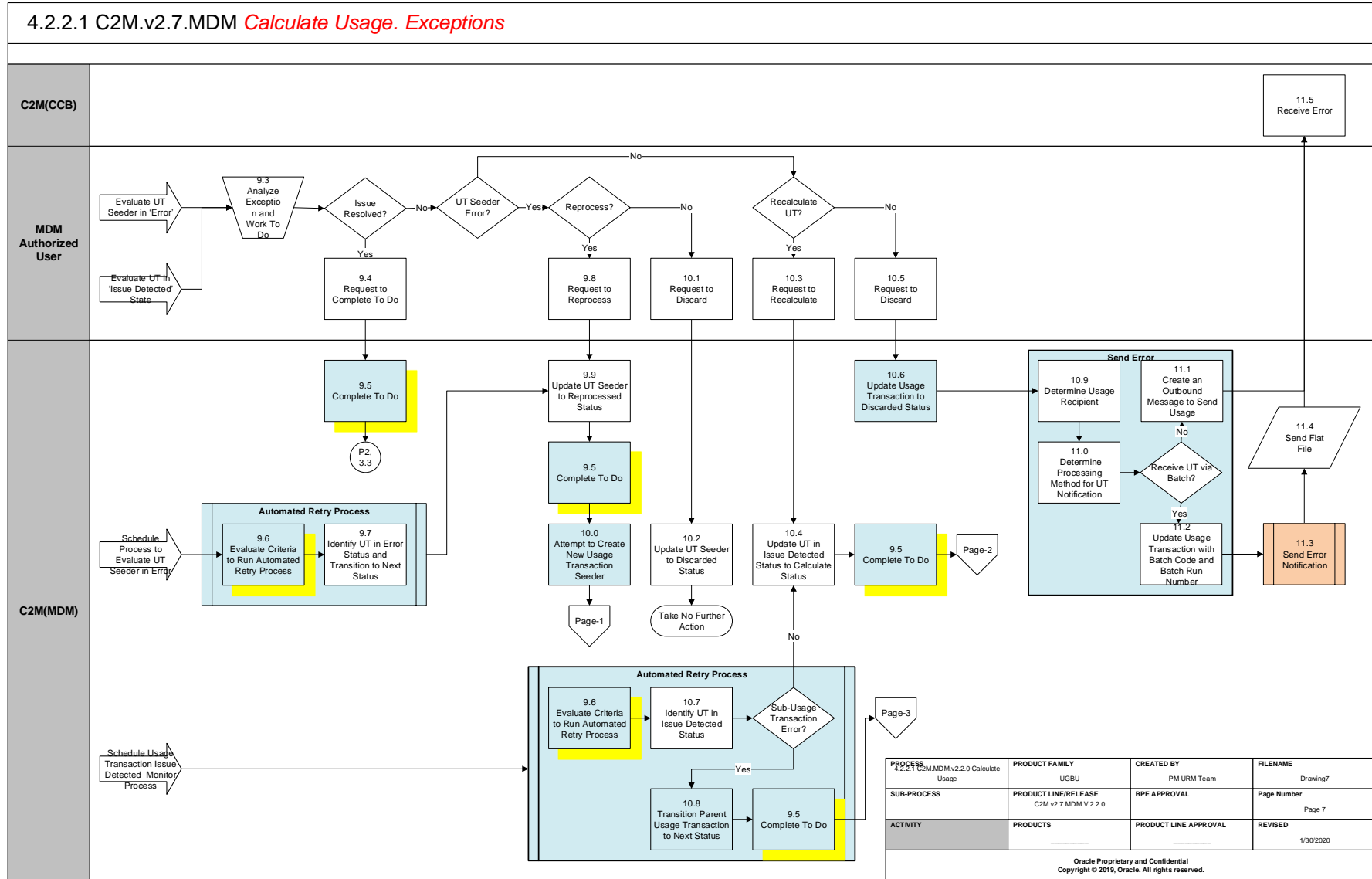


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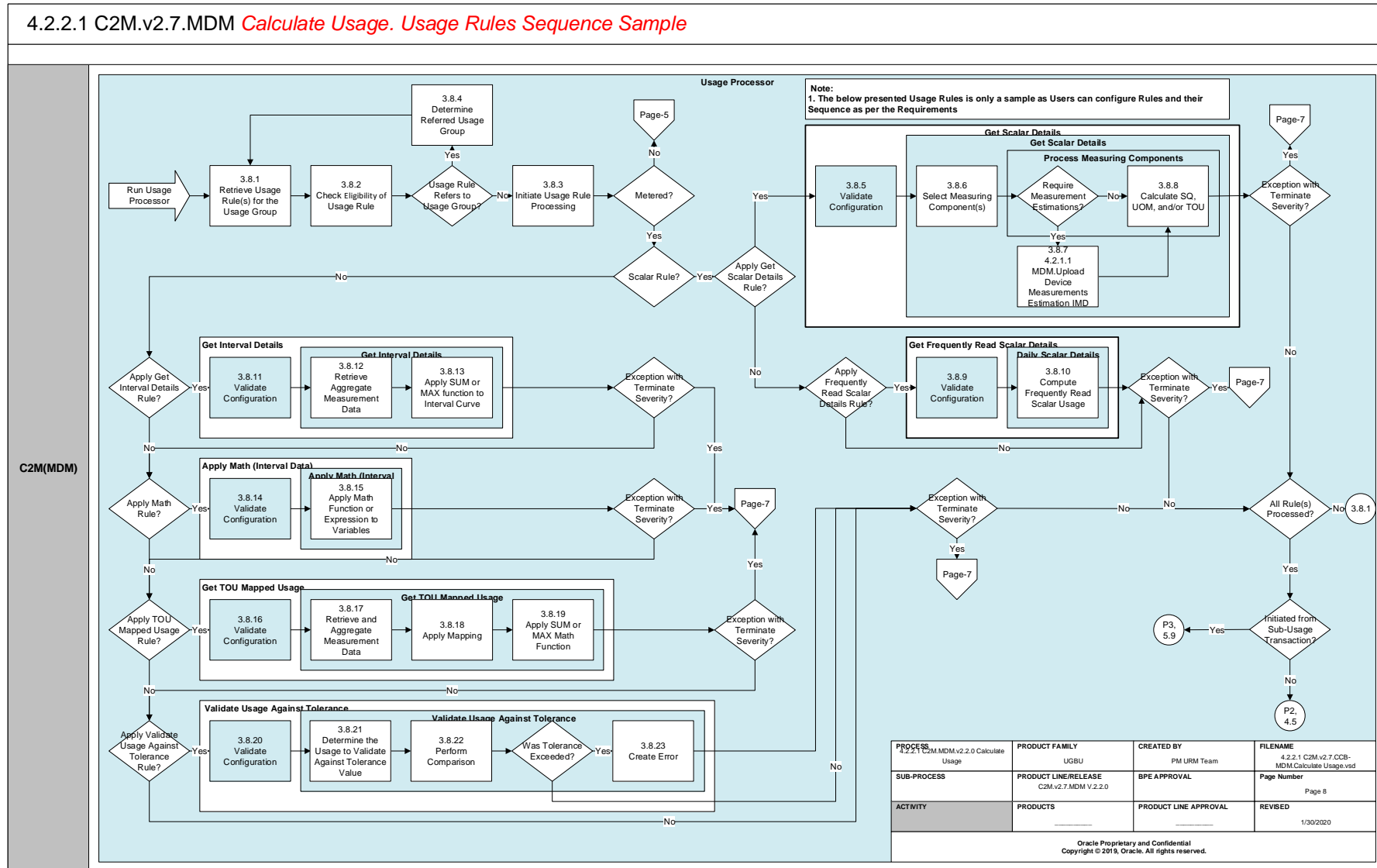
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4.2.2.1 C2M.v2.7.MDM Calculate Usage. Exceptions



Business Process Model Page 8

4.2.2.1 C2M.v2.7.MDM *Calculate Usage. Usage Rules Sequence Sample*



Detail Business Process Model Description

1.0 Determine Usage Subscription (US) ID or External ID

Actor/Role: MDM Authorized User

Description: User selects a Usage Subscription for which to create a Usage Transaction

Configuration required (Y/N)

Entities to Configure:

Usage Subscription

1.1 Populate Required Fields and Usage Periods

Actor/Role: MDM Authorized User

Description: User [populates details](#) about usage calculation period for interval and/or scalar reading, and options about how the Usage Transaction should be processed including “Defer Calculation” and “Automatic Retry”.

1.2 Request to Add Usage Transaction

Actor/Role: MDM Authorized User

Description: Once the User has input all required parameters it is possible to add the Usage Transaction request.

1.3 Receive Usage Transaction Request

Actor/Role: C2M(MDM)

Description: The C2M(MDM) application is often integrated with Third-Party systems that will make ad-hoc Usage Transaction requests for a specific usage periods. An XAI Inbound interface is provided to receive and start the processing of these requests (D2-UsageTransactionRequestInbound). The request should include the C2M(MDM) Usage Subscription ID or the Third-Party External Usage Subscription ID, as well as the dates of the period for which the Usage Transaction should be calculated.

Group: Usage Transaction Pre-processing (Seeder)

1.4 Determine Usage Subscription ID

Actor/Role: C2M(MDM)

Description: Once a Usage Transaction request is received either from an External system or directly entered by the User, the C2M(MDM) application first determines Usage Subscription ID based on provided External Usage Subscription ID.

Process Plug-in enabled (Y)	Available Algorithm(s):	D2-DETUSID
Business Object (Y)	Business Object	D2-UsgTranSeeder

Group: Usage Transaction Pre-processing (Seeder)
1.5 Determine Processing Method via Usage Recipient

Actor/Role: C2M(MDM)

Description: Once the Usage Subscription ID is known, the Usage Recipient (i.e. Service Provider) is either determined directly from the Usage Subscription or the Usage Subscription Type by the Determine Usage Transactions BO. The Usage Recipient specifies the various Processing Methods that define the interactions with the Usage Recipient. The specific Processing Method of interest here is the “Usage Transaction Creation” processing role, which identifies the business object to be used to create the usage transaction.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-DETUTBO
Business Object (Y/N)	Business Object	D2-UsgTranSeeder
Configuration required (Y/N)	Entities to Configure:	Usage Subscription Usage Subscription Type Service Provider Processing Method

Group: Usage Transaction Pre-processing (Seeder)
1.6 Analyze Error and Determine Error(s) via Validation(s)

Actor/Role: C2M(MDM)

Description: If Process Method to create Usage Transaction cannot be determined, then validation algorithms are used to determine the error(s). The validation checks Usage Subscription and dates provided for the interval and scalar periods are valid.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-UTSEEDVAL D2-INSCP-VAL
Business Object (Y/N)	Business Object	D2-UsgTranSeeder

Group: Usage Transaction Pre-processing (Seeder)**1.7 Create UT Seeder in 'Error'****Actor/Role:** C2M(MDM)**Description:** The Usage Transaction Seeder creates a record in an error state.**Business Object (Y/N)****Business Object**[D2-UsgTranSeeder](#)**Group: Usage Transaction Pre-processing (Seeder)****1.8 Determine Usage Transaction Period****Actor/Role:** C2M(MDM)**Description:** When entering the Error status, the start and end dates/times of the Usage Transaction request are determined by using the earliest start date and the latest stop date.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-DET-UTDT

Business Object (Y/N)**Business Object**[D2-UsgTranSeeder](#)**Group: Usage Transaction Pre-processing (Seeder)****1.9 Create To Do****Actor/Role:** C2M(MDM)**Description:** When entering the Error status, a To Do is created to inform the user of detected errors.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-UTSE-TODO

Business Object (Y/N)**Business Object**[D2-UsgTranSeeder](#)**Configuration required (Y/N)****Entities to Configure:**

To Do Type

To Do Role

Group: Create Measurement Cycle Schedule Routes**2.0 Select Measurement Cycles for a Specific Date****Actor/Role:** C2M(MDM)**Description:** The Create Measurement Cycle Schedule Route background process kicks off activities that automatically create Usage Transactions that pushes data to Usage Recipients on a schedule. Measurement Cycle Route(s) not previously been generated and have a scheduled selection date on or before the business date are selected.

Business Object (Y)	Business Object	D1-MeasurementCycleSchedule
Customizable process (N)	Process Name	D1-CMCS
Configuration required (Y)	Entities to Configure:	Measurement Cycle Route
		Measurement Cycle Schedule

Group: Create Measurement Cycle Schedule Routes**2.1 Create Measurement Cycle Schedule Route in Pending Status****Actor/Role:** C2M(MDM)**Description:** For the Measurement Cycle Route(s) that are ready for processing, a Measurement Cycle Schedule Route entry is created in status of Pending.

Business Object (Y)	Business Object	D1-MeasurementCycleSchedule
		D1-SPMsrmtCycScheduleRoute
Customizable process (N)	Process Name	D1-CMCS

Group: Create SP-Measurement Cycle Schedule Route Records**2.2 Evaluate SP Measurement Cycle Schedule Route****Actor/Role:** C2M(MDM)**Description:** The process selects Measurement Cycle Schedule Route(s) are on or before the specified business date and are in a Pending status.

Business Object (Y/N)	Business Object	D1-SPMsrmtCycScheduleRoute
Customizable process (Y/N)	Process Name	D1-CSPSR

Group: Create SP-Measurement Cycle Schedule Route Records**2.3 Create SP/Measurement Cycle Schedule Route in 'Pending' Status****Actor/Role:** C2M(MDM)**Description:** All Service Points that are associated with a Measurement Cycle and Measuring Cycle Route where a Measurement Cycle Schedule Route record exists that is ready for processing will have a Service Point Measurement Cycle Schedule Route record created in a Pending status.

Business Object (Y/N)	Business Object	<input type="text" value="D1-SPMrmtCycScheduleRoute"/>
Customizable process (Y/N)	Process Name	<input type="text" value="D1-CSPSR"/>

Group: Process SP-Measurement Cycle Schedule Route Records**2.4 Identify SP/Measurement Cycle Schedule Route in 'Pending' and Update to 'Complete' State****Actor/Role:** C2M(MDM)**Description:** A batch process transitions the SP / Measurement Cycle Schedule Route BO from "Pending" to "Complete" status. NOTE: The application provides the "Create Usage Transaction" algorithm to create the Usage Transaction which would be plugged into entry of the "Complete" status, however the application is not delivered with this algorithm plugged-in.

Business Object (Y/N)	Business Object	<input type="text" value="D1-SPMrmtCycScheduleRoute"/>
Customizable process (Y/N)	Process Name	<input type="text" value="D1-PSPSR"/>

Group: Process SP-Measurement Cycle Schedule Route Records**2.5 Check if Device Installed in SP(s)****Actor/Role:** C2M(MDM)**Description:** Verify that a device is currently installed at the Service Point.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CRUSGTRN"/>
Business Object (Y/N)	Business Object	<input type="text" value="D1-SPMrmtCycScheduleRoute"/>

Configuration required (Y/N)**Entities to Configure:**

Service Point
Device
Device Configuration
Install Event

Group: Process SP-Measurement Cycle Schedule Route Records**2.6 Determine Usage Subscription(s) linked to the SP****Actor/Role:** C2M(MDM)**Description:** Retrieve the Usage Subscription that is linked to the Service Point with a device installed. The Usage Subscription's start date must be on or before the Scheduled Work Date of the input Measurement Cycle Schedule**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-CRUSGTRN

Business Object (Y/N)**Business Object**

D1-SPMsrmtCycScheduleRoute
--

Configuration required (Y/N)**Entities to Configure:**

Service Point
Usage Subscription

Group: Process SP-Measurement Cycle Schedule Route Records**2.7 Determine Processing Method via Usage Recipient****Actor/Role:** C2M(MDM)**Description:** Find the Usage Recipient (i.e. Service Provider) associated with the Usage Subscription and then determine Processing Method BO associated with the "Usage Transaction Creation" Processing Role.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-CRUSGTRN

Business Object (Y/N)**Business Object**

D1-SPMsrmtCycScheduleRoute
--

Configuration required (Y/N)**Entities to Configure:**

Service Point
Usage Subscription
Service Provider

Group: Process SP-Measurement Cycle Schedule Route Records**2.8 Check if UT exists****Actor/Role:** C2M(MDM)**Description:** If a Usage Transaction for the same Usage Subscription, Start Date/Time, and End Date/Time already exists then do not create.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CRUSGTRN"/>
Business Object (Y/N)	Business Object	<input type="text" value="D1-SPMsrmCycScheduleRoute"/>

Group: Process SP-Measurement Cycle Schedule Route Records**2.9 Create Error****Actor/Role:** C2M(MDM)**Description:** If a Processing Method BO cannot be determined then an error will be generated.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CRUSGTRN"/>
Business Object (Y/N)	Business Object	<input type="text" value="D1-SPMsrmCycScheduleRoute"/>

3.0 Create UT in Pending Status**Actor/Role:** C2M(MDM)**Description:** A Usage Transaction is created in status of Pending. The application monitors for Usage Transactions with the Pending status, and depending on the Defer Calculation flag determines whether to proceed directly to the calculation or to defer the calculation to a scheduled background processes.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-TNORBATCH"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

3.1 Update UT to Calculate Status

Description: If the Usage Transaction is not flagged as “Defer Calculation”, then the status will be immediately transitioned to the “Calculate” status. Upon entering this status, the Calculate Usage algorithm will proceed with performing the necessary calculations. Upon completion of the calculations, first a check will be made to look for exceptions with severity of “issue” or “terminate”, and if found stop processing. Otherwise, the Usage Subscription will be check to find if an Approval is required. The Usage Transaction will then be transitioned to the next status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-CALCUSG
		D2-TR-AF-CAL
		F1-AT-RQJ
Business Object (Y/N)	Business Object	D2-UsageTransaction
		D2-UsgTranProUsgSub
		D2-UsageSubscriptionParentLITE

3.2 Update UT to Calculation Deferred Status

Actor/Role: C2M(MDM)

Description: If the Usage Transaction is flagged as Defer Calculation, then the status will be transitioned to the Calculation Deferred. The start and end date/time will be determined.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-DET-UTDT
		F1-AT-RQJ
Business Object (Y/N)	Business Object	D2-UsageTransaction

3.3 Evaluate UT in Calculation Deferred and Update to Calculate Status

Actor/Role: C2M(MDM)

Description: The “Usage Transaction Calculate Defer Monitor” background batch process will run at scheduled intervals and transitions the Usage Transaction state to “Calculate” to continue processing.

Business Object (Y/N)	Business Object	D2-UsageTransaction
Customizable process (Y/N)	Process Name	D2-UTCD

3.4 Determine UT Start and End Date/Time(s)**Actor/Role:** C2M(MDM)**Description:** The Usage Transactions start and end Date/Time(s) are calculated from the earliest scalar or interval start and the latest scalar or interval end date/ time.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALCUSG"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

3.5 Determine Effective Usage Group(s)**Actor/Role:** C2M(MDM)**Description:** The Usage Group in effect at the start of the usage period is determined by first checking the Usage Subscription. If an effective Usage Group is not found, then the Usage Subscription Type is checked. If no effective User Group is identified, then the Usage Transaction will be set to an “Issue Detected” state and a “To Do” is created. Additionally, it is possible to have multiple Usage Groups in effect during a Usage Period. In the situation where the prorate flag is set to “yes” and there is two separate Usage Groups that apply to different portions of the Usage Period, then a sub-Usage Transactions will need to be created for each Usage Group.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALCUSG"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

3.6 Build Usage Period List via Date Breaks**Actor/Role:** C2M(MDM)**Description:** The Usage Transaction specifies a start and stop date for which usage should be calculated. However, date breaks can also be used to subdivide the Usage Transaction period into smaller periods.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALCUSG"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

3.7 Create Sub UTs and Update Current UT to Calculation in Progress Status

Actor/Role: C2M(MDM)

Description: When multiple Usage Groups are in effect during the Usage Transaction calculation period, a Sub Usage Transaction will be created for each Usage Group. The status of the “parent” Usage Transaction will be transitioned to “Calculation in Progress” status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALCUSG"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/> <input type="text" value="D2-SubUsageTransaction"/>

3.8 Initiate Usage Processor

Actor/Role: C2M(MDM)

Description: The Rules of a Usage Group will be applied separately to each usage period. To calculate the Usage Rules for a usage period, the application calls the Apply Usage Rules (D2-GetUsgGrp) which invokes the Usage Processor (D1-UsageProcessor) business service. The Usage Processor then determines executes the rules of a Usage Group that belong to a specified Usage Rule Category (optional). If no Usage Rule Category is specified then all the rules of the Usage Group are considered for execution. The rules executed can also be limited by assigning Eligibility Criteria to conditionally apply the rule, which provides flexibility in accommodating nonstandard business rules.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALCUSG"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>
Business Service (Y/N)	Business Service	<input type="text" value="D1-UsageProcessor"/>

3.9 Update UT to Issue Detected Status

Actor/Role: C2M(MDM)

Description: While the Usage Transaction is in a Calculate status, during the execution of a Usage Rules, the Transition After Calculation algorithm monitors for exceptions with severity Issue or Terminate. If such an exception occurs, then the Usage Transaction transitions into an Issue Detected status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CK-UG-APR"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

4.0 Create To Do**Actor/Role:** C2M(MDM)**Description:** When the Usage Transaction enters the “Issue Detected” status a To Do will be opened.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-UTIS-TODO
Business Object (Y/N)	Business Object	D2-UsageTransaction

4.1 Create Approval To Do**Actor/Role:** C2M(MDM)**Description:** After successful completion of the Usage Rule calculations, the “Transition After Calculation” algorithm will update the status to “Approval in Progress” if the Usage Subscription indicates that approval is required. Upon entering the “Approval in Progress” status, the application will open a To Do with the “Usage Transaction Requiring Approval” description. The Usage Transaction will then wait for the users review.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-CK-UG-APR D2-UTAP-TODO
Business Object (Y/N)	Business Object	D2-UsageTransaction D2-UsgTranProUsgSub D2-UsageSubscriptionParentLITE
Configuration required (Y/N)	Entities to Configure:	To Do Type To Do Role

4.2 Analyze To Do and Evaluate Usage**Actor/Role:** MDM Authorized User**Description:** The Authorized User will review the calculated values and determine whether to provide approval or to recalculate the result.

Business Object (Y/N)	Business Object	D2-UsageTransaction
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4.3 Request to Approve Usage**Actor/Role:** MDM Authorized User**Description:** An Authorized User can request that the Usage Transaction is approved so that downstream processing can continue.

Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>
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4.4 Update UT to Approved Status**Actor/Role:** C2M(MDM)**Description:** Once an Authorized User has provided approval, the status of the Usage Transaction will be updated to “Approve”. The application will monitor for Usage Transactions in the “Approve” status and automatically transition them to the next status of “Sent”.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="F1-AT-RQ"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>
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4.5 Update UT to Sent Status**Actor/Role:** C2M(MDM)**Description:** The final status in the normal lifecycle is “Sent”. When a Usage Transaction enters this status the Send Usage algorithm will be triggered to send the results to the Usage Recipient. While in this status the user has the ability to make subsequent corrections.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-SEND-USG"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>
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4.6 Determine Usage Recipient**Actor/Role:** C2M(MDM)**Description:** The Service Provider (i.e. Usage Recipient) is determined from the Usage Subscription or Usage Subscription Type

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-SEND-USG"/>
--------------------------------------	--------------------------------	--

Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>
		<input type="text" value="D2-UsgTranProUsgSub"/>

D2-UsgTranProSubTyp

Configuration required (Y/N) **Entities to Configure:**

Usage Subscription
Usage Subscription Type
Service Provider

4.7 Determine Processing Method for UT Notification

Actor/Role: C2M(MDM)

Description: The Service Providers “Processing Methods” can include both a “batch” and “online” notification methods. The method used is set by the “Request Mode” parameter of the Usage Transaction schema.

Process Plug-in enabled (Y/N) **Available Algorithm(s):**

D2-SEND-USG

Business Object (Y/N) **Business Object**

D2-UsageTransaction

Business Service (Y/N) **Business Service**

D1-DetermineServiceProviders

4.8 Create an Outbound Message to Send Usage

Actor/Role: C2M(MDM)

Description: Outbound Message is created and immediately sent to Usage Recipient.

Process Plug-in enabled (Y/N) **Available Algorithm(s):**

D2-SEND-USG

Business Object (Y/N) **Business Object**

D2-UsageTransaction
D2-UsageTranOutboundMesg

4.9 Update Usage Transaction with Batch Code and Batch Run Number

Actor/Role: C2M(MDM)

Description: If the Processing Method is “batch” then the Usage Transaction will be updated with the Batch code and run number returned from the Determine Service Providers Business Service which is called by the “Send Usage” algorithm. This will enable users to determine if the Usage Transaction has actually been sent.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-USG
Business Object (Y/N)	Business Object	D2-UsageTransaction D2-UsageTranOutboundMesg

5.0 Process and Send Usage Transaction

Actor/Role: C2M(MDM)

Description: Batch Control facilitates completing the Usage Transaction by sending the information to the Service Provider.

5.1 Send Flat File

Actor/Role: C2M(MDM)

Description: C2M(MDM) sends a flat file.

5.2 Receive Usage

Actor/Role: C2M(CCB)

Description: A file containing the requested data is received.

Group: Sub-Usage Transaction

5.3 Create Sub-UT in Pending State

Actor/Role: C2M(MDM)

Description: The Sub Usage Transaction created in a status of Pending.

Business Object (Y/N)	Business Object	D2-SubUsageTransaction
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Group: Sub-Usage Transaction

5.4 Update Sub-UT to Calculate State

Actor/Role: C2M(MDM)

Description: The application monitors for Sub Usage Transactions with the Pending status, and promotes them to the Calculate status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	F1-AT-RQJ
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Sub-Usage Transaction**5.5 Determine UT Start and End Date/Time(s)****Actor/Role:** C2M(MDM)**Description:** From the Scalar and Interval start and stop date and time specified in the Sub Usage Transaction, the earliest start time and latest stop time is determined.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALUSGSUB"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Sub-Usage Transaction**5.6 Build Usage Period List****Actor/Role:** C2M(MDM)**Description:** If date brakes are not populated then use the Sub Usage Transaction start and stop date/times as the period. Otherwise, use the date brakes to split the Sub Usage Transaction period into multiple calculation periods.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CALUSGSUB"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Sub-Usage Transaction**5.7 Update UT to Issue Detected State****Actor/Role:** C2M(MDM)**Description:** While the Sub Usage Transaction is in a Calculate status, performing Usage Rules execution, the Transition After Calculation (Sub Usage Transaction) algorithm monitors for exceptions with severity Issue or Terminate. If such an exception occurs, then the Sub Usage Transaction transitions to an Issue Detected status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-TNAFCALCH"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Sub-Usage Transaction**5.8 Create To Do****Actor/Role:** C2M(MDM)**Description:** When the Usage Transaction enters the Issue Detected status, a To Do will be opened.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-UTIS-TODO"/>
--------------------------------------	--------------------------------	---

Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Configuration required (Y/N)	Entities to Configure:	<input type="text" value="To Do Type"/>
		<input type="text" value="To Do Role"/>

Group: Sub-Usage Transaction**5.9 Update Sub-UT to Calculated State****Actor/Role:** C2M(MDM)**Description:** While the Sub Usage Transaction is in a Calculate status, performing Usage Rules execution, the Transition After Calculation (Sub Usage Transaction) algorithm monitors for exceptions. If no exception occurs, then the Sub Usage Transaction transitions to a Calculated status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-TNAFCALCH"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Sub-Usage Transaction**6.0 Execute the Monitor Algorithm(s) of Parent UT's Current Status****Actor/Role:** C2M(MDM)**Description:** When the Sub Usage Transaction enters the Calculated status the Try to Transition Parent Usage Transaction algorithm executes which requests that the Monitor algorithms of the parent Usage Transaction, in the Calculation in Progress status, are executed.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-TRNUSGPNT"/>
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Business Object (Y/N)	Business Object	<input type="text" value="D2-SubUsageTransaction"/>
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Group: Usage Transaction (Parent)**6.1 Update Usage Transaction to Discarded State****Actor/Role:** C2M(MDM)**Description:** While in the Calculation in Progress status, the Usage Transaction monitors the status of its Sub Usage Transactions. If any of the Sub Usage Transactions have a Discarded status, then the parent Usage Transaction will be automatically transitioned to the Discarded status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CHKSUBUT"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

Group: Usage Transaction (Parent)**6.2 Copy Sub UT Usage Calculations to the UT****Actor/Role:** C2M(MDM)**Description:** While in the Calculation in Progress status, the Usage Transaction monitors the status of its Sub Usage Transactions. If all of the Sub Usage Transactions have a Calculated status, then the usage calculations done for each Sub Usage Transaction will be copied to the parent Usage Transaction.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CHKSUBUT"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsageTransaction"/>

Group: Usage Transaction (Parent)**6.3 Create Approval To Do****Actor/Role:** C2M(MDM)**Description:** While in the Calculation in Progress status, the Usage Transaction monitors the status of its Sub Usage Transactions. If all of the Sub Usage Transactions have a Calculated status, then the parent Usage Transaction is ready to transition to the next status. When the Usage Subscription specifies that approval is required, the Usage Transaction will move to the "Approval in Progress". Upon entering the "Approval in Progress" status, the application will open a To Do with the "Usage Transaction Requiring Approval" description. The Usage Transaction will then wait for the users review.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-CHKSUBUT D2-UTAP-TODO
Business Object (Y/N)	Business Object	D2-UsageTransaction D2-UsgTranProUsgSub D2-UsageSubscriptionParentLITE
Configuration required (Y/N)	Entities to Configure:	To Do Type To Do Role

Group: Usage Transaction (Parent)**6.4 Update UT to Sent Status****Actor/Role:** C2M(MDM)

Description: The Usage Transaction can achieve the Sent status in two ways. First while in the Calculation in Progress status, the Usage Transaction monitors the status of its Sub Usage Transactions. If all of the Sub Usage Transactions have a Calculated status, then the parent Usage Transaction is ready to transition to the next status. When the Usage Subscription specifies that approval is not required, the Usage Transaction will move to the Sent. The second way that a Usage Transaction can achieve the Sent status is after the Approval of the Usage Transaction is provided. When a Usage Transaction enters this status the Send Usage algorithm will be triggered to send the results to the Usage Recipient.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-CHKSUBUT
Business Object (Y/N)	Business Object	D2-UsageTransaction

6.5 Request to Recalculate Usage**Actor/Role:** MDM Authorized User

Description: An Authorized User may wish to recalculate the Usage Transaction if new data has been received or if edits were made to the existing data. By selecting recalculate, the Usage Transaction will go back to the "Calculate" status.

Business Object (Y/N)	Business Object	D2-UsageTransaction
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6.6 Retrieve Usage Rule(s) for the Usage Group**Actor/Role:** C2M(MDM)

Description: Retrieve the Usage Rules associated with the Usage Group.

Business Object (Y/N)	Business Object	D1-UsageGroup D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

6.7 Check Eligibility of Usage Rule

Actor/Role: C2M(MDM)

Description: Optionally, a Usage Rule may be assigned Eligibility Criteria that controls the rule's application. This enables a single Usage Group to be flexible in accommodating nonstandard business rules by conditionally applying each Usage Rules. For example, special business rules could apply to premises with solar panels. If a rule is determined to be ineligibility, processing will move on the next rule.

Business Object (Y/N)	Business Object	D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

6.8 Initiate Usage Rule Processing

Actor/Role: C2M(MDM)

Description: A Usage Rule can either be stand alone or refer to another Usage Group. Initiate Usage Rule processing.

Business Object (Y/N)	Business Object	D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

6.9 Determine Referred Usage Group

Actor/Role: C2M(MDM)

Description: When a Usage Rule refers to another Usage Group, the rules within the new group will need to be retrieved and checked for eligibility.

Business Object (Y/N)	Business Object	D1-UsageGroup
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Business Service (Y/N)**Business Service**

D1-UsageProcessor

Group: Apply Interval Usage Rule(s)**7.0 Validate and Apply Pre-calculation Usage Rules****Actor/Role:** C2M(MDM)**Description:** C2M(MDM) validates the availability of configuration data and applies pre-calculation usage rules.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

Alignment and Delay - Validation (D2-VALALGDEL)

Alignment and Delay Usage Rule (D2-ALGNDELAY)

Check Existence of Installed Device (D2-CHKEXTDVC)

Business Object (Y/N)**Business Object**

D2-AlignmentandDelay

D2-ChkExistenceofInstalledDvc

Configuration required (Y/N)**Entities to Configure:**

EXL-ALINDLY

EXL-CHKINSTL

Group: Apply Interval Usage Rule(s)**7.1 Validate and Get Interval Data Details****Actor/Role:** C2M(MDM)**Description:** C2M(MDM) validates the availability of configuration data and gets interval data.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

Get Interval Data - Validation (D2-VALINTDAT)

Get Interval Data (D2-GETINTDAT)

Business Object (Y/N)**Business Object**

D2-GetIntervalData

Configuration required (Y/N)**Entities to Configure:**

EXTRACT KVARH

EXTRACT KWH

GET-KVARH

Group: Apply Interval Usage Rule(s)
7.2 Apply Mapping(s) and Calculate Usage

Actor/Role: C2M(MDM)

Description: C2M(MDM) validates the availability of configuration data, applies TOU and other required mapping. Further it proceeds forward to calculate the Usage based on mathematical and other calculations.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	Get TOU Mapped Usage - Validation (D2-VALTOUUSG)
		Get Time Of Use Mapped Usage (D2-GETTOUUSG)
		Validate Math (D2-VALMATH)
		Vector and Service Quantity Math (D2-MATH)
		Apply Math on Interval Data - Validation (D2-VALAPPMTH)
		Apply Math (Interval Data) (D2-APPMATHIN)
		Xcel Energy - Residential Peak Time Rebate Calculation (DM_RPTR)
Business Object (Y/N)	Business Object	D2-GetTOUUsage
		D2-Math
		D2-ApplyMathInt
		DM_PeakTimeRebate
Configuration required (Y/N)	Entities to Configure:	COINCIDENTPEAK
		DERIVEKW
		DERIVEKWH
		DM-USG-RULE-MATH
		ENG-INTERVALIZE
		EX-SUMCHECK
		GET-KWH-CONS
		GETKWHCURVE
		GETTOTALKWH
		GRAND TOTAL
		KWHCONSFLOWADJ
		KWHCONSUMP
		NEW-CALCULATE-NET-CONSUMPTION3
POWER FACTOR CALCULATION		

POWERFACTOR
PTR-QTY-CALC
TOTALIZATION FOR 43046772 CHAN
TOTALIZATION FOR 55059504 CHAN
TOTALIZATION FOR 61291603 CHAN
TOU MAP YEAR ROUND
TOU-MAP KWH
TOUMAPKWH
TOU-MAP-KWH-ANT

Group: Apply Interval Usage Rule(s)

7.3 Apply Adjustment(s) and/or Rounding

Actor/Role: C2M(MDM)

Description: C2M(MDM) applies adjustments and performs any rounding requirements.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	Round And Adjust Usage - Validation(D2-RNADUSVAL)
		Round And Adjust Usage (D2-RNDADJUSG)
Business Object (Y/N)	Business Object	D2-RoundAndAdjustUsage
Configuration required (Y/N)	Entities to Configure:	ROUND AND ADJUST USAGE

Group: Apply Interval Usage Rule(s)

7.4 Perform Validation(s) and Apply Post-calculation Usage Rules

Actor/Role: C2M(MDM)

Description: C2M(MDM) performs validations and applies post-calculation usage rules. Some of the rules include business flag hold, validation against tolerances, and validating against high low limits.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	Validate Business Flag Hold (D2-VALBFH)
		Identify Business Flag Holds (D2-AUR-IBFH)
		Validate Usage Against Tolerance - Validation (D2-

VALTOL)
Validate Usage Against Tolerance (D2-VALUSGTOL)
Usage High/Low - Validation (D2-VALUGHILO)
Usage High/Low Rule (D2-USGHIGLOW)

Business Object (Y/N) **Business Object**

D2-BusinessFlagHold
D2-ValAgainstTol
D2-UsageHighLowRule

Configuration required (Y/N) **Entities to Configure:**

BUS_FLG_HOLD
EXL-SUMCHK2
RES-KWH-HILO20-BOTH

7.5 Check if All Rule(s) Processed

Actor/Role: C2M(MDM)

Description: C2M(MDM) checks if all the usage rules are processed.

7.6 Evaluate Exception(s)

Actor/Role: C2M(MDM)

Description: C2M(MDM) evaluates exceptions raised during the execution of usage rules.

Process Plug-in enabled (Y/N) **Available Algorithm(s):**

Usage Rule Exception Handler (D2-UREXPCHAN)

Business Object (Y/N) **Business Object**

D2-UsageRuleExceptionHandler

Configuration required (Y/N) **Entities to Configure:**

USAGE RULE EXCP HANDLER

Group: Apply Scalar Usage Rule(s)

7.7 Validate and Apply Pre-calculation Usage Rules

Actor/Role: C2M(MDM)

Description: C2M(MDM) validates the availability of configuration data and applies pre-calculation usage rules.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	Alignment and Delay - Validation (D2-VALALGDEL)
		Alignment and Delay Usage Rule (D2-ALGNDELAY)
		Check Existence of Installed Device (D2-CHKEXTDVC)
Business Object (Y/N)	Business Object	D2-AlignmentandDelay
		D2-ChkExistenceofInstalledDvc
Configuration required (Y/N)	Entities to Configure:	EXL-ALINDLY
		EXL-CHKINSTL

Group: Apply Scalar Usage Rule(s)

7.8 Validate and Select Measuring Component(s)

Actor/Role: C2M(MDM)

Description: Validate that each of the scalar details to be calculated specifies either a [UOM, TOU, or SQI](#). Further, the Usage Rule definition can specify a listing of measuring components to calculate, if nothing is specified in the Usage Rule then all the measuring components defined in the Measuring Component Type will be calculated

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-ValScalar
		D2-GETSCALAR
Business Object (Y/N)	Business Object	D2-GetScalar
		D1-GenericUsageRule
Configuration required (Y/N)	Entities to Configure:	Measuring Component Type
		DM-USG-RULE-KWH
		ENG-GET-SCAL
		GETALLSCALAR
		SCALARCONS
		SUM-SCALAR-TOU-DEMAND-VALUES

Group: Apply Scalar Usage Rule(s)**7.9 4.2.1.1 C2M.MDM.Upload Device Measurements Estimation IMD****Actor/Role:** C2M(MDM)**Description:** If estimation is allowed and the current date is on or after the specified date at which estimations should occur, then an initial measurement will be created.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETSCALAR
Business Object (Y/N)	Business Object	D2-GetScalar
		D1-GenericUsageRule
		D1-GenericAdderIMD

Group: Apply Scalar Usage Rule(s)**8.0 Calculate SQ, UOM, and/or TOU****Actor/Role:** C2M(MDM)**Description:** Calculate each measuring component, and save results as a Usage Scalar Detail record.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETSCALAR
Business Object (Y/N)	Business Object	D2-GetScalar
		D1-GenericUsageRule
		D2-UsageTransaction

Group: Apply Scalar Usage Rule(s)**8.1 Validate and Calculate Frequently Read Scalar Usage****Actor/Role:** C2M(MDM)**Description:** Validate that at least one of the UOM, TOU, or SQI is populated. Further, C2M(MDM) computes daily scalar usage values for measuring components installed at service points associated with usage subscription.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALFRESCR
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D2-GETFRESCR

Business Object (Y/N)

Business Object

D2-CalFrequentlyReadScalar
D1-GenericUsageRule

Group: Apply Scalar Usage Rule(s)

8.2 Perform Validation(s) and Apply Post-calculation Usage Rules

Actor/Role: C2M(MDM)

Description: C2M(MDM) performs validations and applies post-calculation usage rules. Some of the rules include business flag hold, validation against tolerances, and validating against high low limits.

Process Plug-in enabled (Y/N)

Available Algorithm(s):

Validate Business Flag Hold (D2-VALBFH)
Identify Business Flag Holds (D2-AUR-IBFH)
Validate Usage Against Tolerance - Validation (D2-VALTOL)
Validate Usage Against Tolerance (D2-VALUSGTOL)
Usage High/Low - Validation (D2-VALUGHILO)
Usage High/Low Rule (D2-USGHIGLOW)

Business Object (Y/N)

Business Object

D2-BusinessFlagHold
D2-ValAgainstTol
D2-UsageHighLowRule

Configuration required (Y/N)

Entities to Configure:

BUS_FLG_HOLD
EXL-SUMCHK2
RES-KWH-HILO20-BOTH

Group: Get Items Counts and Consumption

8.3 Validate Configuration

Actor/Role: C2M(MDM)

Description: C2M(MDM) performs required validations to process usage rule Get Items Counts and Consumption

Process Plug-in enabled (Y/N)

Available Algorithm(s):

Get Item Counts and Consumption (D2-

GETITEMCC)

Business Object (Y/N)

Business Object

D2-GetItemCountsConsumption
D1-GenericUsageRule

Group: Get Items Counts and Consumption**8.4 Find Item (Multi Item) Based SPs and Determine SP Type(s)**

Actor/Role: C2M(MDM)

Description: C2M(MDM) find Item based service points and determines service point types.

Process Plug-in enabled (Y/N)

Available Algorithm(s):

Get Item Counts and Consumption (D2-GETITEMCC)
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Business Object (Y/N)

Business Object

D2-GetItemCountsConsumption
D1-GenericUsageRule

Group: Get Items Counts and Consumption**8.5 Retrieve Item Details and Calculate SQs for Item Type**

Actor/Role: C2M(MDM)

Description: C2M(MDM) retrieves Item details and calculates Service Quantity for Item type.

Process Plug-in enabled (Y/N)

Available Algorithm(s):

Get Item Counts and Consumption (D2-GETITEMCC)
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Business Object (Y/N)

Business Object

D2-GetItemCountsConsumption
D1-GenericUsageRule

Configuration required (Y/N)

Entities to Configure:

BUS_FLG_HOLD
EXL-SUMCHK2
RES-KWH-HILO20-BOTH
E-ITEMS
ELECTRIC - BADGED ITEM

Group: Get Items Counts and Consumption**8.6 Retrieve Item Details and Calculate SQs for Each Item Type**

Actor/Role: C2M(MDM)

Description: C2M(MDM) retrieves Item details and calculates Service Quantity for Each Item type.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	Get Item Counts and Consumption (D2-GETITEMCC)
Business Object (Y/N)	Business Object	D2-GetItemCountsConsumption D1-GenericUsageRule
Configuration required (Y/N)	Entities to Configure:	E-ITEMS ELECTRIC MULTI-ITEM

[8.7 Request to Notify Usage Recipient Of Subsequent Correction](#)

Actor/Role: MDM Authorized User

Description: When the Usage Transaction is in Send status, an Authorized User has the option to send a notification of Subsequent Correction

[8.8 IMD Received that Overlaps Prior Sent Usage Transaction](#)

Actor/Role: C2M(MDM)

Description: When an IMD is received that overlaps a Usage Transaction that is in Sent status, the status is transitioned to a Subsequent Correction status.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D1-TRAN-UT (Transition Usage Transaction(s))
Business Object (Y/N)	Business Object	D1-InitialLoadIMDInterval D1-InitialLoadIMDScalar D1-ManualIMDInterval D1-ManualIMDScalar D1-EstimationIMDInterval D1-EstimationIMDScalar

[8.9 Determine Usage Recipient](#)

Actor/Role: C2M(MDM)

Description: The Service Provider (i.e. Usage Recipient) is determined from the Usage Subscription or Usage Subscription Type

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-SUBC
Business Object (Y/N)	Business Object	D2-UsageTransaction D2-UsgTranProUsgSub D2-UsgTranProSubTyp
Configuration required (Y/N)	Entities to Configure:	Usage Subscription Usage Subscription Type Service Provider

9.0 Determine Processing Method for UT Subsequent Correction

Actor/Role: C2M(MDM)

Description: The Service Providers “Processing Methods” describes how the notification of subsequent usage corrections is sent.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-USG
Business Object (Y/N)	Business Object	D2-UsageTransaction
Business Service (Y/N)	Business Service	D1-DetermineServiceProviders

9.1 Create an Outbound Message to Send Usage Correction Notification

Actor/Role: C2M(MDM)

Description: Outbound Message is created and immediately sent to Usage Recipient.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-USG
Business Object (Y/N)	Business Object	D2-UsageTransaction D2-UsageTranOutboundMesg

9.2 Receive Notification

Actor/Role: C2M(CCB)

Description: The Usage Recipient receives a notification of subsequent correction.

9.3 Analyze Exception and Work To Do

Actor/Role: MDM Authorized User

Description: The Authorized User will review the issue and determine the next step

9.4 Request to Complete To Do

Actor/Role: MDM Authorized User

Description: The Authorized User will request that the To Do be completed.

9.5 Complete To Do

Actor/Role: C2M(MDM)

Description: The To Do is closed.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D1-GTDCBO
Business Object (Y/N)	Business Object	D2-UsgTranSeeder
		D2-UsageTransaction

9.6 Evaluate Criteria to Run Automated Retry Process

Actor/Role: C2M(MDM)

Description: Select the UT Seeders in the Error status that meet BO, Status Code, and Batch Code restrictions.

Business Object (Y)	Business Object	D2-UsgTranSeeder
Customizable process (N)	Process Name	D2-UTSED

9.7 Identify UT in Error Status and Transition to Next Status

Actor/Role: C2M(MDM)

Description: Transition UT Seeder in the Error status to the next status.

Business Object (Y)	Business Object	<input type="text" value="D2-UsgTranSeeder"/>
Customizable process (N)	Process Name	<input type="text" value="D2-UTSED"/>

9.8 Request to Reprocess

Actor/Role: MDM Authorized User

Description: The Authorized User determines that the UT Seeder should be Reprocessed.

9.9 Update UT Seeder to Reprocessed Status

Actor/Role: C2M(MDM)

Description: The UT Seeder is transitioned to the Reprocess status.

Business Object (Y)	Business Object	<input type="text" value="D2-UsgTranSeeder"/>
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10.0 Attempt to Create New Usage Transaction Seeder

Actor/Role: C2M(MDM)

Description: The Attempt to Reprocess Usage Transaction Seeder algorithm finds the “BO Instance” of the past Seeder attempt, which will be the BO of the UT Seeder if a BO Processing Method could not be found. The UT Seeder then invokes a new Add UT, based on the original inputs. If the “BO Instance” of the next attempt is also the UT Seeder (i.e. still could not find a BO Processing Method), then an error will be thrown and BO of the next attempt will be rolled back and the BO of the first attempt will be transitioned back to the Error status (i.e. this is not shown in the lifecycle)

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-CRE-UTSD"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-UsgTranSeeder"/>

10.1 Request to Discard

Actor/Role: MDM Authorized User

Description: The Authorized User determines the UT Seeder should be discarded.

10.2 Update UT Seeder to Discarded Status

Actor/Role: C2M(MDM)

Description: The UT Seeder is transitioned to a Discarded status

Business Object (Y/N)	Business Object	D2-UsgTranSeeder
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10.3 Request to Recalculate

Actor/Role: MDM Authorized User

Description: The Authorized User determines the UT should be recalculated.

10.4 Update UT in Issue Detected Status to Calculate Status

Actor/Role: C2M(MDM)

Description: The UT is transitioned from the Issue Detected status to the Calculated status

Business Object (Y/N)	Business Object	D2-UsageTransaction
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10.5 Request to Discard

Actor/Role: MDM Authorized User

Description: The Authorized User makes a request to Discard the UT.

10.6 Update Usage Transaction to Discarded Status

Actor/Role: C2M(MDM)

Description: The UT is transitioned from Issue Detected to Discarded status. When a Usage Transaction enters this status the Send Error algorithm will be triggered to notify the Usage Recipient.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-EROR

Business Object (Y/N)	Business Object	D2-UsageTransaction
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10.7 Identify UT in Issue Detected Status**Actor/Role:** C2M(MDM)**Description:** C2M(MDM) identifies Usage Transactions in Issue Detected State.

Business Object (Y)	Business Object	D2-UsageTransaction
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Customizable process (N)	Process Name	D2-UTID
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10.8 Transition Parent Usage Transaction to Next Status**Actor/Role:** C2M(MDM)**Description:** The Parent Usage Transaction is transition to the next available status.

Business Object (Y)	Business Object	D2-UsageTransaction
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10.9 Determine Usage Recipient**Actor/Role:** C2M(MDM)**Description:** The Service Provider (i.e. Usage Recipient) is determined from the Usage Subscription or Usage Subscription Type

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-EROR
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Business Object (Y/N)	Business Object	D2-UsageTransaction
		D2-UsageTransactionExceptions
		D2-UsgTranProUsgSub
		D2-UsgTranProSubTyp

Configuration required (Y/N)	Entities to Configure:	Usage Subscription
		Usage Subscription Type
		Service Provider

11.0 Determine Processing Method for UT Notification

Actor/Role: C2M(MDM)

Description: The Service Providers “Processing Methods” can include both a “batch” and “online” notification methods. The method used is set by the “Request Mode” parameter of the Usage Transaction schema.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-EROR
Business Object (Y/N)	Business Object	D2-UsageTransaction
Business Service (Y/N)	Business Service	D1-DetermineServiceProviders

11.1 Create an Outbound Message to Send Usage

Actor/Role: C2M(MDM)

Description: Outbound Message is created and immediately sent to Usage Recipient.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-EROR
Business Object (Y/N)	Business Object	D2-UsageTransaction
		D2-UsageTranOutboundMesg

11.2 Update Usage Transaction with Batch Code and Batch Run Number

Actor/Role: C2M(MDM)

Description: If the Processing Method is “batch” then the Usage Transaction will be updated with the Batch code and run number returned from the Determine Service Providers Business Service which is called by the “Send Usage” algorithm. This will enable users to determine if the Usage Transaction has actually been sent.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-SEND-EROR
Business Object (Y/N)	Business Object	D2-UsageTransaction
		D2-UsageTranOutboundMesg

11.3 Send Error Notification

Actor/Role: C2M(MDM)

Description: Batch Control facilitates completing the Usage Transaction by sending the error to the Service Provider.

11.4 Send Flat File

Actor/Role: C2M(MDM)

Description: C2M(MDM) sends flat file.

11.5 Receive Error

Actor/Role: C2M(CCB)

Description: The Service Provider receives the error file.

Sample - Usage Processor Calculate Usage

[3.8.1 Retrieve Usage Rule\(s\) for the Usage Group](#)

Actor/Role: C2M(MDM)

Description: Retrieve the Usage Rules associated with the Usage Group.

Business Object (Y/N)	Business Object	D1-UsageGroup D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

[3.8.2 Check Eligibility of Usage Rule](#)

Actor/Role: C2M(MDM)

Description: Optionally, a Usage Rule may be assigned Eligibility Criteria that controls the rule's application. This enables a single Usage Group to be flexible in accommodating nonstandard business rules by conditionally applying each Usage Rules. For example, special business rules could apply to premises with solar panels. If a rule is determined to be ineligibility, processing will move on the next rule.

Business Object (Y/N)	Business Object	D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

[3.8.3 Initiate Usage Rule Processing](#)

Actor/Role: C2M(MDM)

Description: A Usage Rule can either be stand alone or refer to another Usage Group. Initiate Usage Rule processing.

Business Object (Y/N)	Business Object	D1-GenericUsageRule
Business Service (Y/N)	Business Service	D1-UsageProcessor

[3.8.4 Determine Referred Usage Group](#)

Actor/Role: C2M(MDM)

4.2.2.1 C2M.v2.7.MDM.Calculate Usage

Description: When a Usage Rule refers to another Usage Group, the rules within the new group will need to be retrieved and checked for eligibility.

Business Object (Y/N)	Business Object	<input type="text" value="D1-UsageGroup"/>
Business Service (Y/N)	Business Service	<input type="text" value="D1-UsageProcessor"/>

Group: Get Scalar Details
[3.8.5 Validate Configuration](#)

Actor/Role: C2M(MDM)

Description: Validate that each of the scalar details to be calculated specifies either a [UOM, TOU, or SQI](#).

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-ValScalar"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-GetScalar"/> <input type="text" value="D1-GenericUsageRule"/>

Group: Get Scalar Details
[3.8.6 Select Measuring Component\(s\)](#)

Actor/Role: C2M(MDM)

Description: The Usage Rule definition can specify a listing of measuring components to calculate, if nothing is specified in the Usage Rule then all the measuring components defined in the Measuring Component Type will be calculated.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	<input type="text" value="D2-GETSCALAR"/>
Business Object (Y/N)	Business Object	<input type="text" value="D2-GetScalar"/> <input type="text" value="D1-GenericUsageRule"/>
Configuration required (Y/N)	Entities to Configure:	<input type="text" value="Measuring Component Type"/>

Group: Get Scalar Details
[3.8.7 4.2.1.1 C2M.MDM.Upload Device Measurements Estimation IMD](#)

Actor/Role: C2M(MDM)

Description: If estimation is allowed and the current date is on or after the specified date at which estimations should occur, then an initial measurement will be created.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETSCALAR
Business Object (Y/N)	Business Object	D2-GetScalar
		D1-GenericUsageRule
		D1-GenericAdderIMD

Group: Get Scalar Details

3.8.8 Calculate SQ, UOM, and/or TOU

Actor/Role: C2M(MDM)

Description: Calculate each measuring component, and save results as a Usage Scalar Detail record.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETSCALAR
Business Object (Y/N)	Business Object	D2-GetScalar
		D1-GenericUsageRule
		D2-UsageTransaction

Group: Get Frequently Read Scalar Details

3.8.9 Validate Configuration

Actor/Role: C2M(MDM)

Description: Validate that at least one of the UOM, TOU, or SQI is populated.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALFRESCR
Business Object (Y/N)	Business Object	D2-CalFrequentlyReadScalar
		D1-GenericUsageRule

Group: Get Frequently Read Scalar Details**3.8.10 Compute Frequently Read Scalar Usage****Actor/Role:** C2M(MDM)**Description:** C2M(MDM) computes daily scalar usage values for measuring components installed at service points associated with usage subscription.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETFRESCR
Business Object (Y/N)	Business Object	D2-CalFrequentlyReadScalar D1-GenericUsageRule

Group: Get Interval Details**3.8.11 Validate Configuration****Actor/Role:** C2M(MDM)**Description:** Validate that at least one of UOM, TOU, or SQI is specified in the Usage Rule

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALINTDAT
Business Object (Y/N)	Business Object	D2-GetIntervalData D1-GenericUsageRule

Group: Get Interval Details**3.8.12 Retrieve Aggregate Measurement Data****Actor/Role:** C2M(MDM)**Description:** Find all the Service Points for the given Usage Subscription with active Device Configuration at any time within the usage period. Retrieve the Device Configuration's Measuring Components and check if they are applicable for the calculation specified by the Usage Rule. Aggregate usage from all Service Points.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETINTDAT
Business Object (Y/N)	Business Object	D2-GetIntervalData D1-GenericUsageRule

Group: Get Interval Details**[3.8.13](#) Apply SUM or MAX function to Interval Curve****Actor/Role:** C2M(MDM)**Description:** Apply SUM or MAX function to Interval Curve and save results to the Usage Period Service Quantities (SQ).

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETINTDAT
Business Object (Y/N)	Business Object	D2-GetIntervalData
		D1-GenericUsageRule
		D2-UsageTransaction

Group: Apply Math (Interval Data)**[3.8.14](#) Validate Configuration****Actor/Role:** C2M(MDM)**Description:** Validate that at least one UOM, TOU, or SQI result is populated in the Usage Rule. Additionally, the configuration of the calculation is validated based on Calculation Type.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALAPPMTH
Business Object (Y/N)	Business Object	D2-ApplyMathInt
		D1-GenericUsageRule

Group: Apply Math (Interval Data)**[3.8.15](#) Apply Math Function or Expression to Variables****Actor/Role:** C2M(MDM)**Description:** The necessary variables are computed, and then either the math function or the mathematical expression is applied in order to determine the final value. Results are saved to the Usage Period Service Quantities (SQ).

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-APPMATHIN
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Business Object (Y/N)**Business Object**

D2-ApplyMathInt
D2-UsageTransaction
D1-GenericUsageRule

Group: Get TOU Mapped Usage**[3.8.16](#) Validate Configuration****Actor/Role:** C2M(MDM)**Description:** Validate that either UOM or SQI is populated in the Usage Rule.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-VALTOUUSG

Business Object (Y/N)**Business Object**

D2-GetTOUUsage
D1-GenericUsageRule

Group: Get TOU Mapped Usage**[3.8.17](#) Retrieve and Aggregate Measurement Data****Actor/Role:** C2M(MDM)**Description:** Find all the Service Points for the given Usage Subscription with active Device Configuration at any time within the usage period. Retrieve the Device Configuration's Measuring Components and check if they are applicable for the calculation specified by the Usage Rule. Aggregate usage from all Service Points.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-GETTOUUSG

Business Object (Y/N)**Business Object**

D2-GetTOUUsage
D1-GenericUsageRule

Group: Get TOU Mapped Usage**[3.8.18](#) Apply Mapping****Actor/Role:** C2M(MDM)**Description:** Apply the TOU mapping to the interval curve.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETTOUUSG
Business Object (Y/N)	Business Object	D2-GetTOUUsage D1-GenericUsageRule

Group: Get TOU Mapped Usage**3.8.19 Apply SUM or MAX Math Function****Actor/Role:** C2M(MDM)**Description:** Apply either the SUM or MAX to values within a TOU period. Results are saved to the Usage Period Service Quantities (SQ).

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-GETTOUUSG
Business Object (Y/N)	Business Object	D2-GetTOUUsage D2-UsageTransaction D1-GenericUsageRule

Group: Validate Usage Against Tolerance**3.8.20 Validate Configuration****Actor/Role:** C2M(MDM)**Description:** Validate that the Usage Rule specifies at least one valid UOM, TOU, or SQI. Also, either the tolerance value or factor must be populated.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALTOL
Business Object (Y/N)	Business Object	D2-ValAgainstTol D1-GenericUsageRule

Group: Validate Usage Against Tolerance**3.8.21 Determine the Usage to Validate Against Tolerance Value****Actor/Role:** C2M(MDM)**Description:** For each Service Quantity calculated for the Usage Transaction period, apply the validation set function to find either the SUM, MAX, or MIN of the Service Quantities. The Tolerance Value can either be a specific value or defined via a Factor.

Process Plug-in enabled (Y/N)	Available Algorithm(s):	D2-VALUSGTOL
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Business Object (Y/N)**Business Object**

D2-ValAgainstTol
D1-GenericUsageRule

Group: Validate Usage Against Tolerance**3.8.22 Perform Comparison****Actor/Role:** C2M(MDM)**Description:** Compare the Tolerance value to the Usage value.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-VALUSGTOL

Business Object (Y/N)**Business Object**

D2-ValAgainstTol
D1-GenericUsageRule

Group: Validate Usage Against Tolerance**3.8.23 Create Error****Actor/Role:** C2M(MDM)**Description:** An exception is issued with a specified severity level.**Process Plug-in enabled (Y/N)****Available Algorithm(s):**

D2-VALUSGTOL

Business Object (Y/N)**Business Object**

D2-ValAgainstTol
D1-GenericUsageRule

Test Documentation related to the Current Process

ID	Document Name	Test Type

Document Control

Change Record

Date	Author	Version	Change Reference
06/13/2011	Mark Barnhart	1	Initial Version
09/10/2011	Galina Polonsky	1	Reviewed
10/21/2012	Layne Nelson	1	Reviewed
09/10/2015	Srinivas Kanteti	2	Update for V2.1
11/20/2015	Walter Wolanski		Reviewed
11/20/2015	Galina Polonsky	2.1	Minor updates, Reviewed
11/20/2015	Galina Polonsky		Approved
6/7/2019	Satya Kalavala		Updated format for v2.7
1/30/2020	Antonio Napoli		Changed Filename, Process name as per URM formatting in this document and Visio

Attachments

Usage Transaction Lifecycle



Usage Transaction
Life Cycle

Sub Usage Transaction Lifecycle



Sub Usage
Transaction Lifecycle

Usage Transaction Seeder Lifecycle



Usage Transaction
Seeder Lifecycle

SP / Measurement Cycle Schedule Route Lifecycle



SP Measurement
Cycle Schedule Route

Usage Transaction Seeder



Usage Transaction
Seeder

Get Scalar Details



Get Scalar Details

Usage Rules



Usage Rules