



METER DATA MANAGEMENT V 2.2.0

4.2.1.2 MDM.Manage VEE and VEE Exceptions

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Brief Description

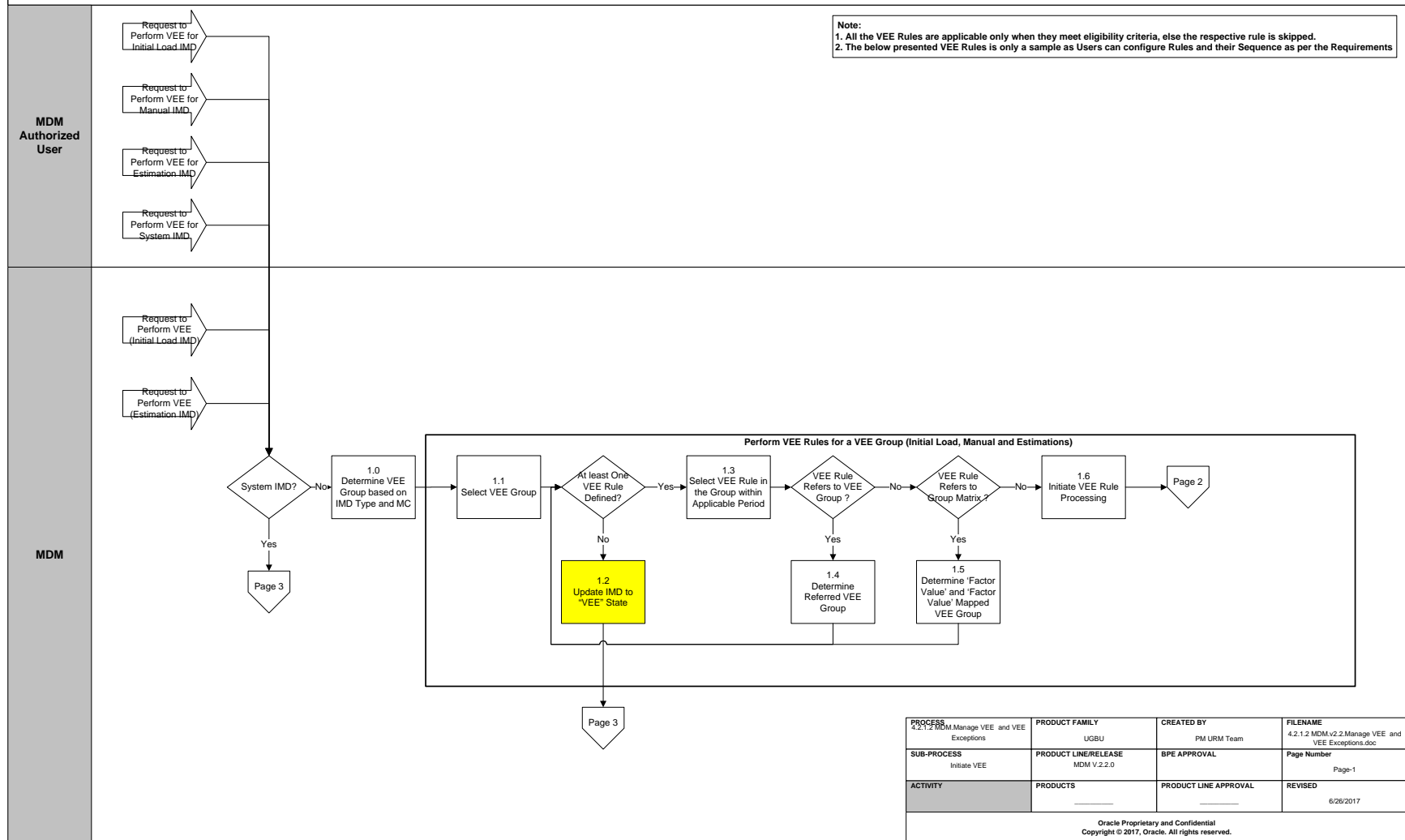
Business Process: 4.2.1.2 MDM.Manage VEE and VEE Exceptions
Process Type: Process
Parent Process: 4.2.1 MDM. Collect and Process Measurements
Sibling Processes: 4.2.1.1 MDM.Upload Device Measurements, 4.2.1.3 MDM.Calculate Usage

This process gets initiated when the IMD is loaded into the system, has passed the VEE Ready state across its life-cycle and is ready for VEE Processing. The various types of IMDs i.e. Initial Load, Manual, and Estimation can have VEE process invoked either through System or by User. For System IMDs, VEE process is skipped as it involves reprocessing of existing measurements due to change in Meter multiplier or Installation constant.

During the VEE process, various VEE rules configured logically under a VEE Group, assigned for the respective IMD MC Type are applied. Each of the rules may be a single rule or can refer to another group of VEE Rules through specific selection criteria. These VEE rules fall into different categories such as common validation rules for validation and replacements, estimation rules for missing measurements, and consumption rules to check the sanity of consumption. Any exceptions encountered, during the VEE process, may lead to either termination of the whole VEE Process or continuation based on the severity of exception, followed by Exception Processing. With the successful pass through of the VEE, the IMD moves towards normalization and finalization, where on Usage Transaction related processes take on. For Scalar MCs, if a Meter Reader Remark exists, then Reader Remark processing is initiated and processed.

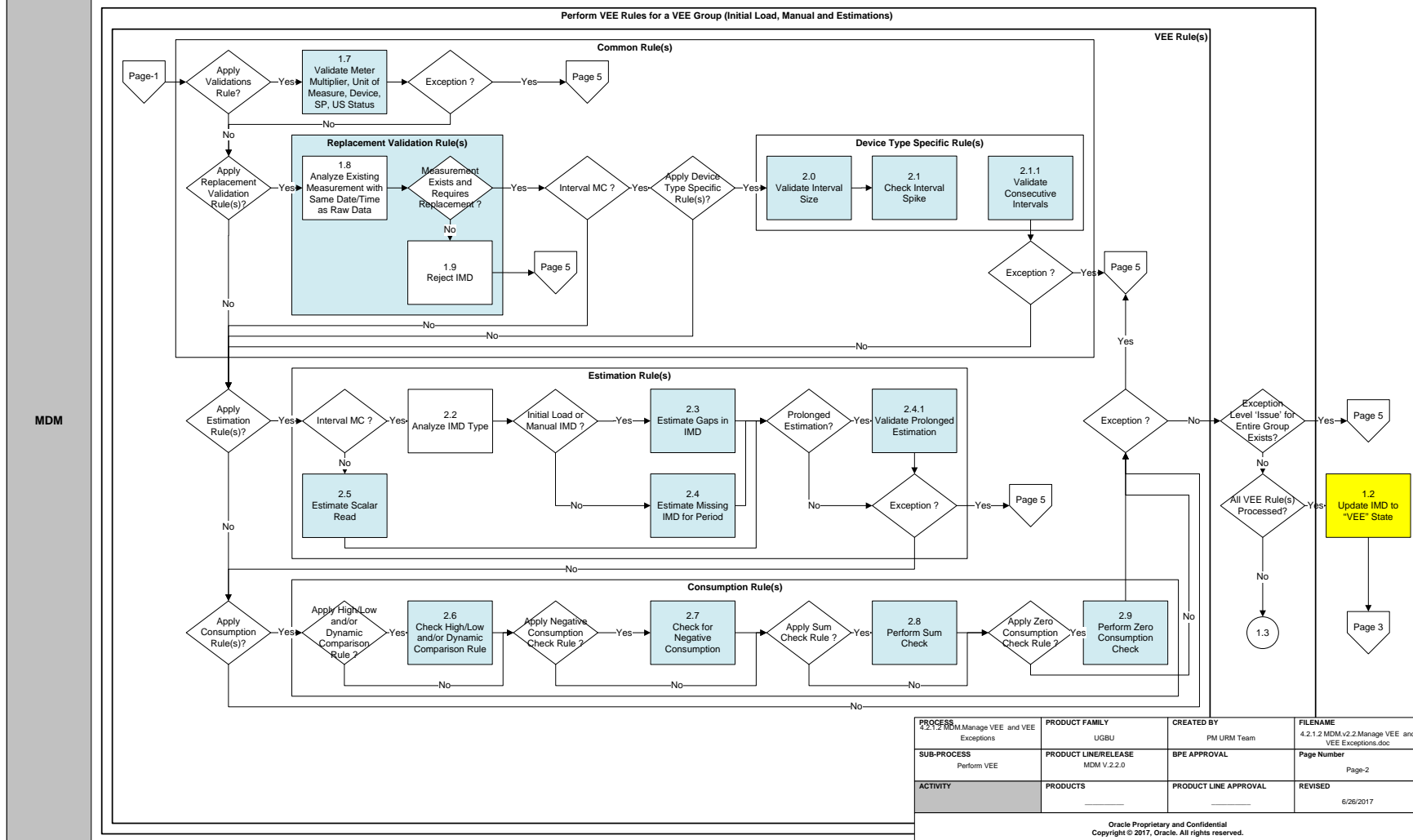
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4.2.1.2 MDM. V2.2.0. *Manage VEE and VEE Exceptions. Initiate VEE*



Business Process Model Page 2

4.2.1.2 MDM. V2.2.0. *Manage VEE and VEE Exceptions. Perform VEE*

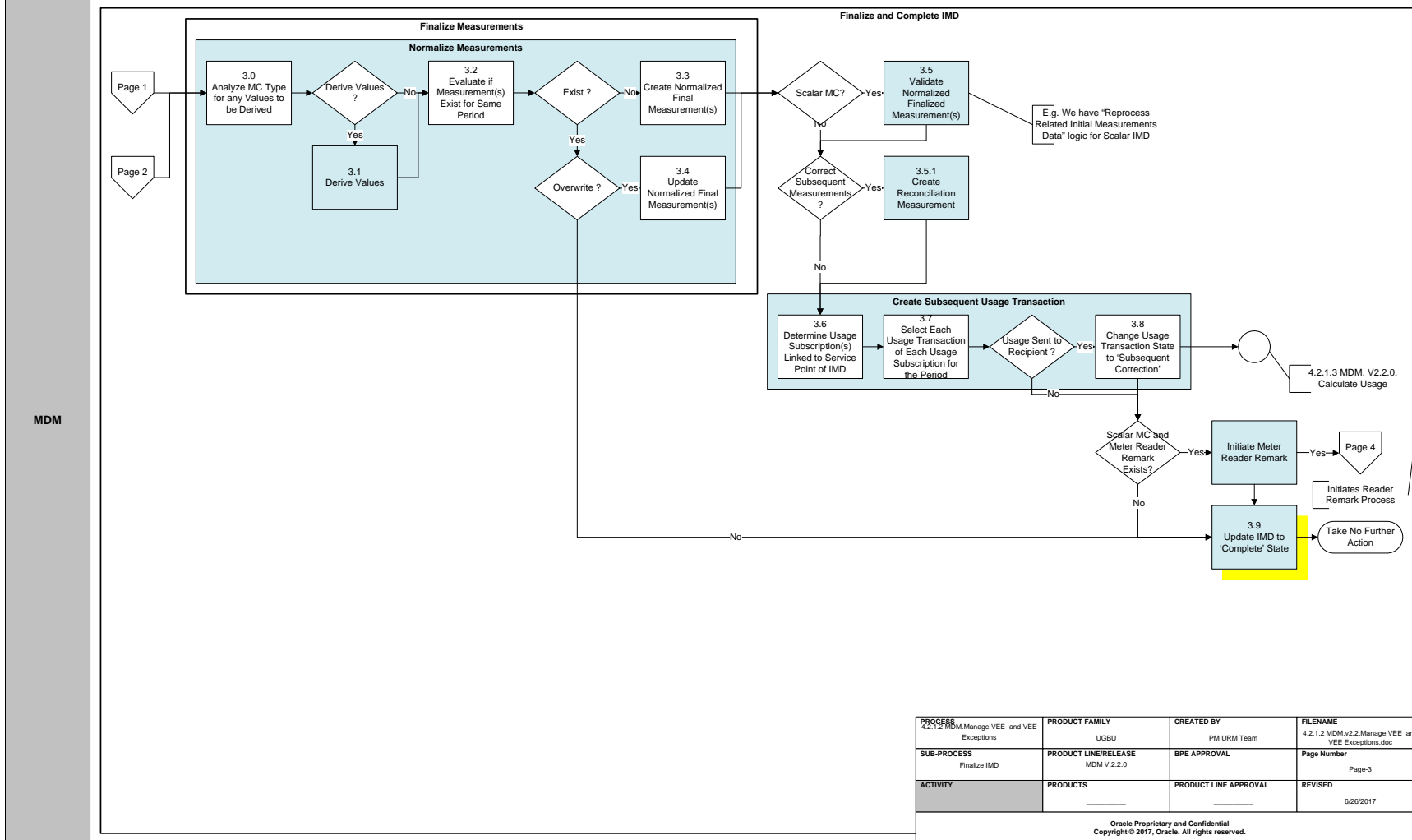


| | | | |
|--|-------------------------------------|---------------------------|--|
| PROCESS 4.2.1.2 MDM.Manage VEE and VEE Exceptions | PRODUCT FAMILY UGBU | CREATED BY PM URM Team | FILENAME 4.2.1.2 MDM.v2.2.Manage VEE and VEE Exceptions.doc |
| SUB-PROCESS Perform VEE | PRODUCT LINE/RELEASE MDM V.2.2.0 | BPE APPROVAL | Page Number Page-2 |
| ACTIVITY | PRODUCTS | PRODUCT LINE APPROVAL | REVISED 6/26/2017 |

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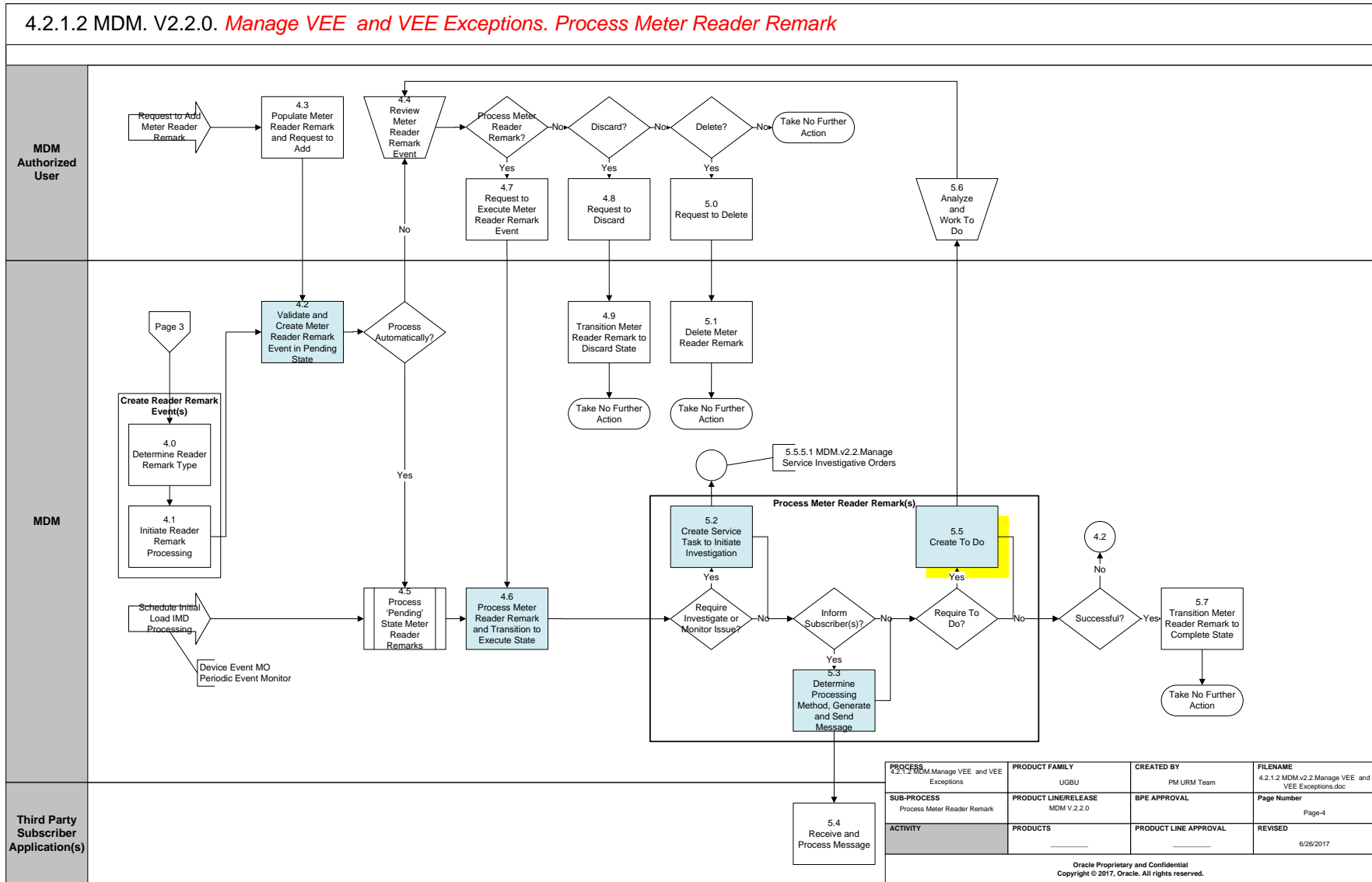
4.2.1.2 MDM. V2.2.0. *Manage VEE and VEE Exceptions. Finalize IMD*



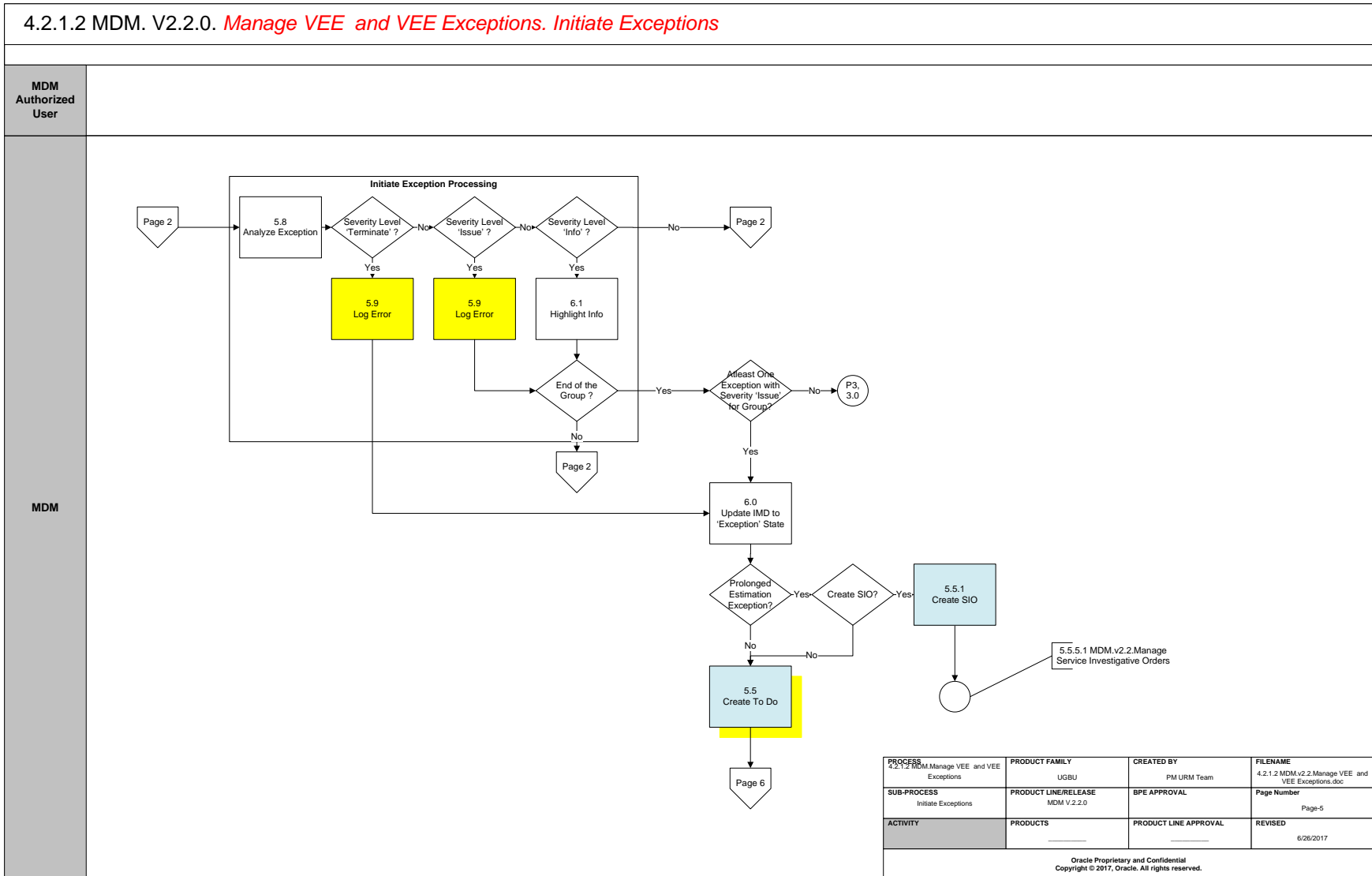
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| PROCESS 4.2.1.2 MDM.Manage VEE and VEE Exceptions | PRODUCT FAMILY UGBU | CREATED BY PM URM Team | FILENAME 4.2.1.2 MDM.v2.2.Manage VEE and VEE Exceptions.doc |
| SUB-PROCESS Finalize IMD | PRODUCT LINE/RELEASE MDM V.2.2.0 | BPE APPROVAL | Page Number Page-3 |
| ACTIVITY | PRODUCTS | PRODUCT LINE APPROVAL | REVISED 6/26/2017 |

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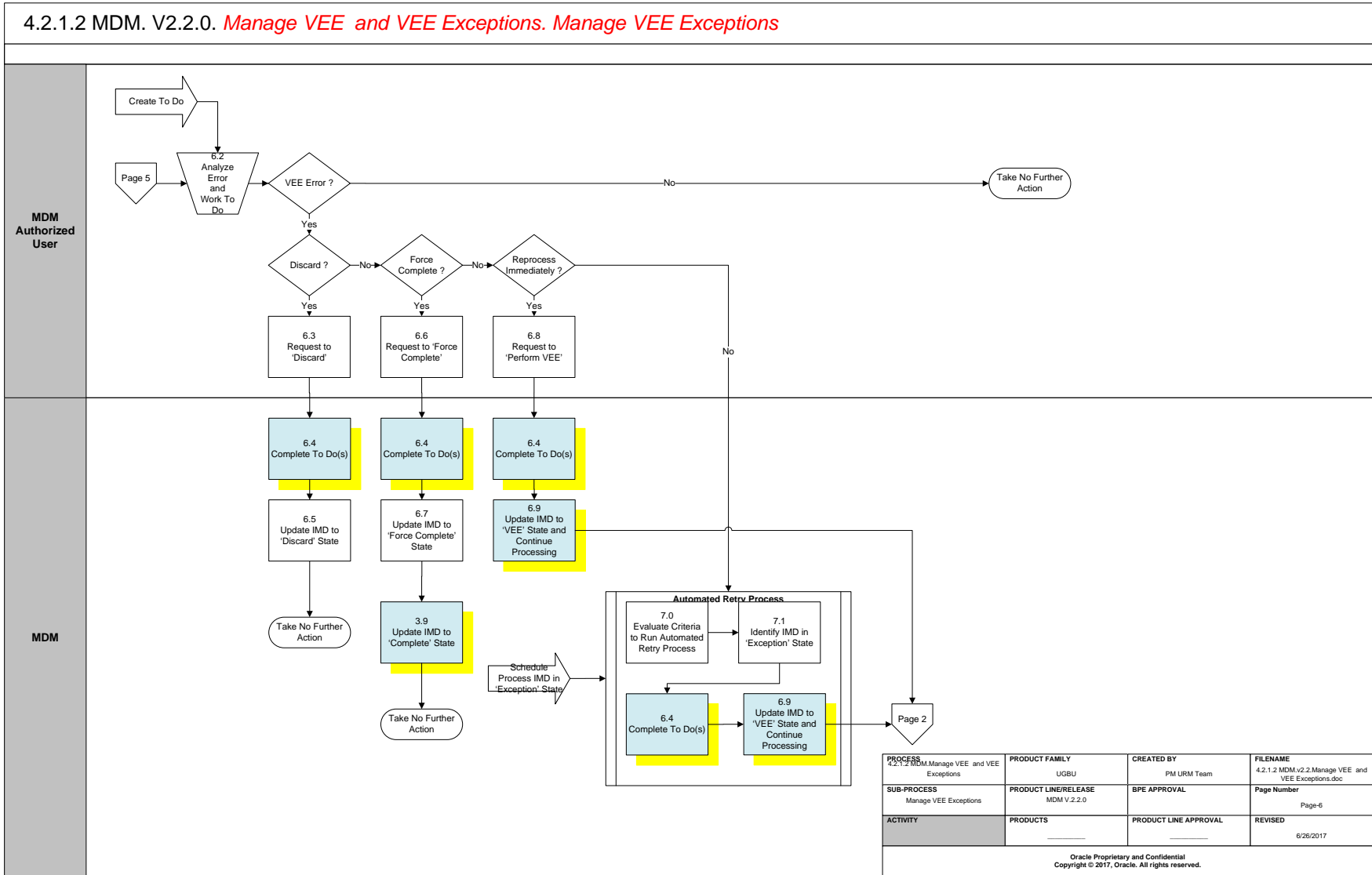
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Business Process Model Page 5



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Detail Business Process Model Description

1.0 Determine VEE Group based on IMD Type and MC

Actor/Role: MDM

Description: MDM validates the date/time based on the IMD Type and determines the [VEE Group configured for the Measuring Component](#) derived from the IMD.

| | | |
|-------------------------------------|-------------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |
| Configuration required (Y/N) | Entities to Configure: | VEE Rules |
| | | VEE Group |
| | | Measuring Component |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.1 Select the VEE Group

Actor/Role: MDM

Description: MDM selects the VEE Group based on the Measuring Component to perform VEE process.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-PVSIIMDIL (Perform VEE for Subtractive Interval Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDSubtrInterval |

| Business Object (Y/N) | Business Object |
|-----------------------|--|
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.2 Update IMD to “VEE” State

Actor/Role: MDM

Description: MDM updates the IMD to VEE State.

| Process Plug-in enabled (Y/N) | Available Algorithm(s): |
|-------------------------------|--|
| | F1-AT-RQJ (Transition to Default Next Status) |

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.3 Select VEE Rule in the Group within Applicable Period

Actor/Role: MDM

Description: MDM selects the [VEE Rules configured in the VEE Group](#) as per the configured sequence and filters the Rules based on their applicability with respect to the Execution date for IMD. A rule is applicable for IMD if the VEE Execution date falls between the Start date and End date of the rule Life time. If there is no End date specified for VEE Rule, the Execution date should be after the [Life time](#) Start Date of the VEE Rule.

| Process Plug-in enabled (Y/N) | Available Algorithm(s): |
|-------------------------------|--|
| | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | D1-ESTM-VEE (Perform VEE for Estimation IMD) |

| |
|---|
| D1-InitialLoadIMDInterval |
|---|

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|-----------|
| Configuration required (Y/N) | Entities to Configure: | VEE Rules |
| | | VEE Group |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.4 Determine Referred VEE Group

Actor/Role: MDM

Description: MDM determines the [VEE Group referred by the VEE Rule](#).

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|------------------------|
| Configuration required (Y/N) | Entities to Configure: | VEE Group for VEE Rule |
|-------------------------------------|-------------------------------|------------------------|

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.5 Determine 'Factor Value' and 'Factor Value' Mapped VEE Group

Actor/Role: MDM

Description: MDM dynamically determines the factor value for a VEE Rule and determines the [VEE Group mapped to the Factor value](#).

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|------------------------|
| Configuration required (Y/N) | Entities to Configure: | VEE Groups and Factors |
|-------------------------------------|-------------------------------|------------------------|

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

1.6 Initiate VEE Rule Processing

Actor/Role: MDM

Description: MDM initiates VEE processing.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Common Rule(s)

1.7 Validate Meter Multiplier, Unit of Measure, Device, SP, US Status

Actor/Role: MDM

Description: Common rules are rules that can be applicable to an IMD irrespective of the type of meter i.e. Scalar or Interval. The Meter Multiplier Rule ensures that the Meter Multiplier value of the current Measurement Data matches the Meter Multiplier value stored on the Measuring Component. The Unit of Measure rule will check to ensure that the Unit-of-Measure (UOM) of the incoming data matches the UOM specified on the Measuring Component. MDM also ensures IMD exists for sibling MCs. The inactive measurement check rule ensures that no IMD is received for a state where a device is disconnected, install event is not present, or there is no active Usage Subscription.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D2-REGMULCHK (Multiplier Check) |
| | | D2-UOMCHK (Unit of Measure Check) |
| | | D2-ENSIMDMC (Ensure Initial Measurement Exists for Sibling Measuring Components) |
| | | D2-VRFYTRES (Verify Threshold for Check Disconnected Device) |
| | | D2-INACTVCHK (Inactive Measurement Check) |
| Business Object (Y/N) | Business Object | D2-RegisterMultiplierCheck |
| | | D2-UOMCheck |
| | | D2-EnsureIMDExistsForSibling |
| | | D2-InactiveMeasurementCheck |
| Configuration required (Y/N) | Entities to Configure: | Multiplier Check |
| | | Unit of Measure |
| | | VEE Rule for Inactive Measurement Check |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Common Rule(s)

1.8 Analyze Existing Measurement with Same Date/Time as Raw Data

Actor/Role: MDM

Description: MDM system analyses if there exists any existing Measurement in the same period as of the current measurement. Further, it analyses if the existing measurement is system read or manually edited.

| |
|--|
| D1-INIT-VEE (Perform VEE for Initial Load IMD) |
|--|

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D2-INTREPRL (Interval Replacement Rule) |
| | | D2-SCAREPRL (Scalar Replacement Rule) |

| | | |
|------------------------------|------------------------|----------------------------|
| Business Object (Y/N) | Business Object | D2-IntervalReplacementRule |
| | | D2-ScalarReplacementRule |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Common Rule(s)

1.9 Reject IMD

Actor/Role: MDM

Description: When the measurement exists with same date/time as the raw data, MDM validates the applicability of replacement, and determines if the raw reading will be rejected completely or rejected only if the existing measurement is manually user-edited. Further, MDM also has functionality to validate rejection based on Condition codes, Value change tolerance, Percentage change tolerance or combination of these.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D2-INTREPRL (Interval Replacement Rule) |
| | | D2-SCAREPRL (Scalar Replacement Rule) |
| | | D2-VALFINRPL (Final Measurement Replacement - Validation) |
| | | D2-VLMSRCOND (Final Measurement Replacement Check) |

| | | |
|------------------------------|------------------------|-------------------------------|
| Business Object (Y/N) | Business Object | D2-IntervalReplacementRule |
| | | D2-ScalarReplacementRule |
| | | D2-FinalMeasurementValidation |

| | | |
|-------------------------------------|-------------------------------|--|
| Configuration required (Y/N) | Entities to Configure: | Replacement Handling Method |
| | | VEE Rule for Final Measurement Replacement |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)**Group: VEE Rule(s)****Group: Common Rule(s)****Group: Device Type Specific Rule(s)****2.0 Validate Interval Size****Actor/Role:** MDM**Description:** MDM checks to ensure that the Interval Size of the Initial Measurement Data matches the defined value in the Measuring Component Type.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) D2-INTSIZVAL (Interval Size Validation) |
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval D2-IntervalSizeValidation (Interval Size Validation) |
| Configuration required (Y/N) | Entities to Configure: | VEE Group and Rules SPI on Measuring Component |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)**Group: VEE Rule(s)****Group: Common Rule(s)****Group: Device Type Specific Rule(s)****2.1 Check Interval Spike****Actor/Role:** MDM**Description:** MDM examines interval data to identify intervals with suspiciously high usage relative to surrounding intervals.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) D2-INTSPKCHK (Interval Spike Check) |
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval D2-IntervalSpikeCheck (Interval Spike Check) |

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

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Common Rule(s)

Group: Device Type Specific Rule(s)

2.1.1 Validate Consecutive Intervals

Actor/Role: MDM

Description: MDM validates the incoming IMD for the presence of consecutive sets of measurement values or condition codes or both that is configured. This validation aids to find faulty meters that are reporting consecutive outage codes, zero measurements, or negative values. It can also be used by water utilities to identify leaks based on the interval never reaching zero.

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

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

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

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Estimation Rule(s)

2.2 Analyze IMD Type

Actor/Role: MDM

Description: MDM system analyses if the IMD is an Estimate IMD or Manual IMD to take further course of Estimation process.

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

| | | |
|------------------------------|------------------------|--------------------------|
| Business Object (Y/N) | Business Object | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Estimation Rule(s)

2.3 Estimate Gaps in IMD

Actor/Role: MDM

Description: MDM proceeds forward to estimate the gaps in the Initial Load IMD and the Manual IMD. This estimation is invoked manually using various types of estimation techniques for actual estimation.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D1-MNOV-VEE (Perform VEE for Manual IMD) |
| | | D2-INTINTEST (Interval Interpolation Estimation) |
| | | D2-INTAVGEST (Interval Averaging Estimation) |
| | | D2-INTPROEST (Interval Profile Estimation) |
| | | D2-INTADJSCA (Interval Adjustment Based on Related Scalar Measurement) |

| | | |
|------------------------------|------------------------|--------------------------------|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-ManualIMDInterval |
| | | D2-IntervalInterpolationEst |
| | | D2-IntervalAveragingEstimation |
| | | D2-IntervalProfileEstimation |
| | | D2-IntervalAdjustmentFrmScalar |

| | | |
|-------------------------------------|-------------------------------|--------------------------|
| Configuration required (Y/N) | Entities to Configure: | VEE Group for Estimation |
|-------------------------------------|-------------------------------|--------------------------|

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Estimation Rule(s)**2.4 Estimate Missing IMD for Period****Actor/Role:** MDM**Description:** MDM validates if the gap between the last continuous reading and current IMD is more than a configured period, and if so it raises an exception otherwise it will fill the gap on a real-time with estimated IMDs. For any gaps that are not filled, MDM uses periodic estimation to fill those gaps.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D2-INTINTEST (Interval Interpolation Estimation) |
| | | D2-INTAVGEST (Interval Averaging Estimation) |
| | | D2-INTPROEST (Interval Profile Estimation) |
| | | D2-INTADJSCA (Interval Adjustment Based on Related Scalar Measurement) |
| | | D2-CREESTVAL (Create Estimation IMD Rule - Validation) |
| | | D2-CREESTIMD (Create Estimation IMD Rule) |
| Business Object (Y/N) | Business Object | D1-EstimationIMDInterval |
| | | D2-IntervalInterpolationEst |
| | | D2-IntervalAveragingEstimation |
| | | D2-IntervalProfileEstimation |
| | | D2-IntervalAdjustmentFrmScalar |
| | | D2-CreateEstimationIMDRule |
| Configuration required (Y/N) | Entities to Configure: | VEE Rule for Create IMD for gap |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)**Group: VEE Rule(s)****Group: Estimation Rule(s)****2.4.1 Validate Prolonged Estimation****Actor/Role:** MDM**Description:** MDM validates to check if the estimation of measurements has been undergoing beyond configured number of days. If so it raises an exception and can also lead to creation of Service Investigative Order (SIO).

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D2-PROESTVAL (Prolonged Estimation Check - Validation) |
| | | D2-PROESTCHK (Prolonged Estimation Check) |

| | | |
|------------------------------|------------------------|-----------------------------|
| Business Object (Y/N) | Business Object | D2-ProlongedEstimationCheck |
|------------------------------|------------------------|-----------------------------|

| | | |
|-------------------------------------|-------------------------------|---|
| Configuration required (Y/N) | Entities to Configure: | VEE Rule for Prolonged Estimation Check |
|-------------------------------------|-------------------------------|---|

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Estimation Rule(s)

2.5 Estimate Scalar Read

Actor/Role: MDM

Description: MDM estimate Scalar value for Estimate IMD Scalar using various estimation techniques.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D2-SCAPROEST (Estimate Scalar Based on Profile Data) |
| | | D2-SCACALINT (Scalar Calculation from Interval) |
| | | D2-SCALAREST (Estimate Scalar Amount Based on Historical Data) |

| | | |
|------------------------------|------------------------|----------------------------|
| Business Object (Y/N) | Business Object | D1-EstimationIMDScalar |
| | | D2-ScalarProfileEstimation |
| | | D2-ScalarCalcFromInterval |
| | | D2-ScalarEstimation |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Consumption Rule(s)

2.6 Check High/Low and/or Dynamic Comparison Rule

Actor/Role: MDM

Description: MDM checks the Initial Measurement for high or low consumption. “High Tolerance” or “High Tolerance Factor” and “Low Tolerance” or “Low Tolerance Factor” is defined against which the check is performed. Further, on an advanced level, MDM also provides functionality to compare and check value derived based on the measurement to a value derived statistically based on the history values. This helps Utilities to look for unusual usage patterns.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D2-HILO-CHK (High/Low Check) |
| | | D2-DYNCOMVAL (Dynamic Comparison - Validation) |
| | | D2-DYNCOMCHK (Dynamic Comparison Check) |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D2-VEERuleHighLowCheck (High/Low Check) |
| | | D2-DynCompValidation |

| | | |
|-------------------------------------|-------------------------------|------------------------------------|
| Configuration required (Y/N) | Entities to Configure: | VEE Group and Rules |
| | | High Tolerance or Tolerance Factor |
| | | Low Tolerance or Tolerance Factor |
| | | Historical Percentage Required |
| | | Historical Pre-Window |
| | | Historical Post-Window |
| | | Comparison Method (Average / Max) |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Consumption Rule(s)

2.7 Check for Negative Consumption

Actor/Role: MDM

Description: MDM will check if consumption has any negative values.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D2-NCON-CHK (Negative Consumption Check) |

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D2-NegativeConsumptionCheck (Negative Consumption Check) |

| | | |
|-------------------------------------|-------------------------------|---------------------|
| Configuration required (Y/N) | Entities to Configure: | VEE Group and Rules |
|-------------------------------------|-------------------------------|---------------------|

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Consumption Rule(s)

2.8 Perform Sum Check

Actor/Role: MDM

Description: MDM evaluates whether consumption for the current Initial Measurement Data is within a tolerance of the sum of the consumption during the same period for any measuring components related to the current one.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D2-SUM-CHK (Sum Check) |

| | | |
|------------------------------|------------------------|---------------------------|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D2-SumCheck (Sum Check) |

| | | |
|-------------------------------------|-------------------------------|----------------------------|
| Configuration required (Y/N) | Entities to Configure: | Percentage Tolerance |
| | | Tolerance |
| | | Meter Multiplier Tolerance |

Group: Perform VEE Rules for a VEE Group (Initial Load, Manual and Estimations)

Group: VEE Rule(s)

Group: Consumption Rule(s)

2.9 Perform Zero Consumption Check

Actor/Role: MDM

Description: MDM evaluates if there exists zero consumption or an outage occurred for the current Initial Measurement Data within the IMD's period.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| | | D2-ZEROCNCHK (Zero Consumption Check) |
| | | D2-OACHKVAL (Zero Consumption Outage Activity Validation) |

| | | |
|------------------------------|------------------------|---------------------------|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D2-ZeroConsumptionCheck |

| | | |
|-------------------------------------|-------------------------------|-------------------------------|
| Configuration required (Y/N) | Entities to Configure: | Outage Bottom Range Condition |
| | | Outage Top Range Condition |

Group: Finalize Measurements

3.0 Analyze MC Type for any Values to be Derived

Actor/Role: MDM

Description: MDM analyses the Measuring Component Type to determine the Measurement BO and populate the data by mapping with Post-VEE Raw Measurement data. It further checks if there are any algorithms configured to derive other values based on current values.

| | | |
|--------------------------------------|--------------------------------|---------------------------------------|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-AUTO-NORM (Normalize Measurements) |
| | | Value Derivation Algorithms |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |
| | | D1-SystemIMDScalar |
| | | D1-SystemIMDInterval |

Group: Finalize Measurements

3.1 Derive Values

Actor/Role: MDM

Description: MDM derives other values based on the current measurements.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-SNORMIMD (Scalar Normalize measurements (overwrite identical existing Measurements)) |
| | | D1-AUTO-NORM (Normalize Measurements) |
| | | Value Derivation Algorithms |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |
| | | D1-SystemIMDScalar |
| | | D1-SystemIMDInterval |

Group: Finalize Measurements

3.2 Evaluate if Measurement(s) Exist for Same Period

Actor/Role: MDM

Description: MDM checks if there exists any finalized measurement whose date/time matches with the current measurement.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-SNORMIMD (Scalar Normalize measurements (overwrite identical existing Measurements)) |
| | | D1-AUTO-NORM (Normalize Measurements) |
| | | Value Derivation Algorithms |

| |
|---|
| D1-InitialLoadIMDInterval |
|---|

| Business Object (Y/N) | Business Object |
|-----------------------|--|
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |
| | D1-SystemIMDScalar |
| | D1-SystemIMDInterval |

Group: Finalize Measurements

3.3 Create Normalized Final Measurement(s)

Actor/Role: MDM

Description: MDM creates normalized measurements if there does not exist finalized measurement matching the same date/time as of the current measurement.

| Process Plug-in enabled (Y/N) | Available Algorithm(s): |
|-------------------------------|---|
| | D1-SNORMIMD (Scalar Normalize measurements (overwrite identical existing Measurements)) |
| | D1-AUTO-NORM (Normalize Measurements) |
| | Value Derivation Algorithms |

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |
| | D1-SystemIMDScalar |
| | D1-SystemIMDInterval |

Group: Finalize Measurements

3.4 Update Normalized Final Measurement(s)

Actor/Role: MDM

Description: MDM updates the existing measurement with current measurement.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-SNORMIMD (Scalar Normalize measurements (overwrite identical existing Measurements)) |
| | | D1-EVAL-EXMS (Reevaluate Existing Measurements) |
| | | D1-AUTO-NORM (Normalize Measurements) |
| | | Value Derivation Algorithms |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |
| | | D1-SystemIMDScalar |
| | | D1-SystemIMDInterval |

| | | |
|-------------------------------------|-------------------------------|---|
| Configuration required (Y/N) | Entities to Configure: | Overwrite Identical Existing Measurement(s) |
|-------------------------------------|-------------------------------|---|

3.5 Validate Normalized Finalized Measurement(s)

Actor/Role: MDM

Description: MDM performs any validations on the normalized data over here. For Scalar Estimate IMD, MDM checks if there exists an Initial Measurement Data (IMD) in the Error state where its Measuring Component (MC) has a related MC with a relationship type flag of 'Consumption Check' that is equal to the current IMD's MC. If MDM finds such an IMD, it transitions that IMD to the VEE state.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-REP-RLIMD (Reprocess Related Initial Measurement Data(s)) |
|--------------------------------------|--------------------------------|--|

| |
|---|
| D1-InitialLoadIMDInterval |
|---|

| Business Object (Y/N) | Business Object |
|-----------------------|--|
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |
| | D1-SystemIMDScalar |
| | D1-SystemIMDInterval |

3.5.1 Create Reconciliation Measurement

Actor/Role: MDM

Description: MDM if identifies a need to correct subsequent measurements then it creates a reconciliation measurement.

| Process Plug-in enabled (Y/N) | Available Algorithm(s): |
|-------------------------------|--|
| | D1-CRRCNLIMD (Create Reconciliation IMD) |

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |
| | D1-SystemIMDScalar |
| | D1-SystemIMDInterval |

3.6 Determine Usage Subscription(s) Linked to Service Point of IMD

Actor/Role: MDM

Description: MDM using the Measuring Component information on the measurement data determines the Device Configuration, Service Point related to the Device Configuration, and finally the Usage Subscription(s) linked to the Service Point.

| 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 |
| | | D1-SystemIMDScalar |
| | | D1-SystemIMDInterval |

| | | |
|-------------------------------------|-------------------------------|-----------------------|
| Configuration required (Y/N) | Entities to Configure: | Device Configuration |
| | | Service Points |
| | | Usage Subscription(s) |
| | | Usage Transaction(s) |

3.7 Select Each Usage Transaction of Each Usage Subscription for the Period

Actor/Role: MDM

Description: MDM for each Usage Subscription determines the Usage Transaction(s) that fall within the period of IMD.

| | | |
|--------------------------------------|--------------------------------|--|
| 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 |
| | | D1-SystemIMDScalar |
| | | D1-SystemIMDInterval |

| | | |
|-------------------------------------|-------------------------------|-----------------------|
| Configuration required (Y/N) | Entities to Configure: | Usage Subscription(s) |
| | | Usage Transaction(s) |

[3.8](#) Change Usage Transaction State to ‘Subsequent Correction’

Actor/Role: MDM

Description: MDM, for each Usage Transaction, checks if the Usage information has already been sent out, by checking for ‘Sent’ state, and if yes, it updates the Transition Condition to ‘Sub-sequent Correction’ state.

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 |
| D1-SystemIMDScalar |
| D1-SystemIMDInterval |

[3.9](#) Update IMD to ‘Complete’ State

Actor/Role: MDM

Description: MDM updates the status of IMD to ‘Complete’ and updates the most recent measurement date/time.

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

| |
|--|
| D1-UPDMSDTTM (Update Most Recent Measurement Date/Time on Scalar MC) |
| D1-UPD-DTMC (Update Latest Measurement Date/Time on MC with Consumption Sync Service and Measurement Data Foundation) |
| D1-UDTSIWOCI (Update Latest Date/Time on Subtr Intval MC w/ Maint Read and Cons Sync) |

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |
| | D1-SystemIMDScalar |
| | D1-SystemIMDInterval |

Group: Create Reader Remark Event(s)

4.0 Determine Reader Remark Type

Actor/Role: MDM

Description: MDM determines Meter Reader Remark type based on the reader remark in the IMD data.

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

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

Group: Create Reader Remark Event(s)

4.1 Initiate Reader Remark Processing

Actor/Role: MDM

Description: MDM initiates Meter Reader Remark event processing for those scalar MCs where a Meter Reader remark is available in IMD raw data.

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

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

4.2 Validate and Create Meter Reader Remark Event in Pending State

Actor/Role: MDM

Description: MDM validates if the required data is available for creating a Meter Reader Remark.

Further, if the request to create Meter Reader Remark is made by an Authorized User, MDM checks if there exists any other Meter Reader Remark of same type for the device in non-final state. If Meter Reader Remark exists, MDM reports an error to the User.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-DFLT-RRIN (Default Reader Remark Inputs) D1-RRECK-VAL (Reader Remark Existence Check) |
| Business Object (Y/N) | Business Object | D1-ReaderRemark |

4.3 Populate Meter Reader Remark and Request to Add

Actor/Role: MDM Authorized User

Description: MDM Authorized User populates data to create Meter Reader Remark and requests to add.

4.4 Review Meter Reader Remark Event

Actor/Role: MDM Authorized User

Description: MDM Authorized User reviews Meter Reader Remark created in the system.

4.5 Process 'Pending' State Meter Reader Remarks

Actor/Role: MDM

Description: The volume of Meter Reader Remarks that MDM receives with raw meter data is significant. Therefore in most of the cases Meter Reader Remarks in 'Pending' status are being processed by batch process. Business determines how often this batch process should run to process Pending Meter Reader Remarks.

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
| | | Device Event MO Periodic Monitor Process (D1- |

| | | |
|-----------------------------------|---------------------|------------------------------------|
| Customizable process (Y/N) | Process Name | <input type="text" value="DVEVT"/> |
|-----------------------------------|---------------------|------------------------------------|

4.6 Process Meter Reader Remark and Transition to Execute State

Actor/Role: MDM

Description: MDM validates if the Meter Reader Remark is eligible for processing and accordingly processes it. If the Reader Remark is not eligible further processing does not take place and Meter Reader Remark is directly completed. However this is not a majority case.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | <input type="text" value="D1-RR-ELIG (Reader Remark Eligibility)"/> |
|--------------------------------------|--------------------------------|---|

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | <input type="text" value="D1-ReaderRemark"/> |
|------------------------------|------------------------|--|

4.7 Request to Execute Meter Reader Remark Event

Actor/Role: MDM Authorized User

Description: MDM Authorized User if wishes to execute the Meter Reader Remark immediately, User can make a request to process it.

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | <input type="text" value="D1-ReaderRemark"/> |
|------------------------------|------------------------|--|

4.8 Request to Discard

Actor/Role: MDM Authorized User

Description: MDM Authorized User if wishes to discard the Meter Reader Remark, User can make a request to discard it.

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | <input type="text" value="D1-ReaderRemark"/> |
|------------------------------|------------------------|--|

4.9 Transition Meter Reader Remark to Discard State

Actor/Role: MDM

Description: MDM transitions Meter Reader Remark to discard state. When a Meter Reader Remark is discarded it still remains in the system.

| | | |
|------------------------------|------------------------|---------------------------------|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
|------------------------------|------------------------|---------------------------------|

5.0 Request to Delete

Actor/Role: MDM Authorized User

Description: MDM Authorized User if wishes to delete Meter Reader Remark, User can make a request to delete it.

| | | |
|------------------------------|------------------------|---------------------------------|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
|------------------------------|------------------------|---------------------------------|

5.1 Delete Meter Reader Remark

Actor/Role: MDM

Description: MDM deletes Meter Reader Remark from the system.

| | | |
|------------------------------|------------------------|---------------------------------|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
|------------------------------|------------------------|---------------------------------|

Group: Process Meter Reader Remark(s)

5.2 Create Service Task to Initiate Investigation

Actor/Role: MDM

Description: MDM creates Service Task to monitor Service Point and Initiate Investigation.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-DVCEVTSIM (Create Service Issue Monitor from Device Event) |
|--------------------------------------|--------------------------------|---|

| | | |
|------------------------------|------------------------|---------------------------------|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
|------------------------------|------------------------|---------------------------------|

Group: Process Meter Reader Remark(s)

5.3 Determine Processing Method, Generate and Send Message

Actor/Role: MDM

Description: MDM determines subscribers interested in the Reader Remark message, determines processing method, generates message, and sends outbound message to respective subscribers.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-RRSENDSUB (Send to Subscribers for Reader Remark) |
|--------------------------------------|--------------------------------|--|

| | | |
|------------------------------|------------------------|---------------------------------|
| Business Object (Y/N) | Business Object | D1-ReaderRemark |
|------------------------------|------------------------|---------------------------------|

5.4 Receive and Process Message

Actor/Role: Third Party Subscriber Application(s)

Description: Third Party Subscriber Application(s) receive and process Meter Reader Remark message.

5.5 Create To Do

Actor/Role: MDM

Description: MDM creates a [To Do entry](#) for the Authorized User to allow Authorized User to review the issue, problem and attempt to work on it.

Note: Only one To Do Entry is created for the Exception List of "Open" exceptions that have a severity of "Terminate" or "Issues".

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-CRE-IMDTD (Create To Do) D1-CRE-RR-TD (Create To Do Entry for Reader Remark) |
|--------------------------------------|--------------------------------|--|

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |
| | | D1-ReaderRemark |

| | | |
|-------------------------------------|-------------------------------|--------------------|
| Configuration required (Y/N) | Entities to Configure: | Exception Type |
| | | Exception Severity |
| | | To Do Role |
| | | To Do Type |

5.5.1 Create SIO**Actor/Role:** MDM**Description:** MDM creates a Service Investigative Order (SIO). Please refer to process **5.5.5.1 MDM.v2.2.Manage Service Investigative Orders** for more details.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D2-PROESTVAL (Prolonged Estimation Check - Validation) D2-PROESTCHK (Prolonged Estimation Check) |
| Business Object (Y/N) | Business Object | D2-ProlongedEstimationCheck |
| Configuration required (Y/N) | Entities to Configure: | Exception Type with Service Issue Monitor |

5.6 Analyze and Work To Do**Actor/Role:** MDM Authorized User**Description:** MDM Authorized User analyzes the To Do created and determines the action for the issue. User performs work to address the To Do task.

| | | |
|--------------------------------------|--------------------------------|---|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-CRE-RR-TD (Create To Do Entry for Reader Remark) |
| Business Object (Y/N) | Business Object | D1-ReaderRemark |

5.7 Transition Meter Reader Remark to Complete State**Actor/Role:** MDM**Description:** MDM updates the Meter Reader Remark to complete state.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | F1-AT-RQJ (Transition to Default Next Status) |
|--------------------------------------|--------------------------------|--|

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

| |
|---------------------------------|
| D1-ReaderRemark |
|---------------------------------|

Group: Initiate Exception Processing

5.8 Analyze Exception

Actor/Role: MDM

Description: When an exception takes place during VEE Processing, MDM analyzes the severity of the exception based on the configuration.

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

| |
|--|
| D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| D1-MNOV-VEE (Perform VEE for Manual IMD) |
| D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| D1-TRN-EXCP (Transition on Exception) |

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

| |
|---|
| D1-InitialLoadIMDInterval |
| D1-InitialLoadIMDScalar |
| D1-ManualIMDInterval |
| D1-ManualIMDScalar |
| D1-EstimationIMDInterval |
| D1-EstimationIMDScalar |

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

| |
|----------------------------------|
| Exception Severity for VEE Rules |
|----------------------------------|

Group: Initiate Exception Processing

5.9 Log Error

Actor/Role: MDM

Description: MDM logs error, if it comes across an exception of severity 'Issue' or "Terminate" during VEE processing.

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

| |
|--|
| D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| D1-MNOV-VEE (Perform VEE for Manual IMD) |
| D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| D1-TRN-EXCP (Transition on Exception) |

| |
|---|
| D1-InitialLoadIMDInterval |
|---|

| | | |
|------------------------------|------------------------|--|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|----------------------------------|
| Configuration required (Y/N) | Entities to Configure: | Exception Severity for VEE Rules |
|-------------------------------------|-------------------------------|----------------------------------|

Group: Initiate Exception Processing
6.0 Update IMD to 'Exception' State

Actor/Role: MDM

Description: MDM automatically updates IMD status to 'Exception'

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | F1-AT-RQJ (Transition to Default Next Status) |
|--------------------------------------|--------------------------------|--|

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|--------------------|
| Configuration required (Y/N) | Entities to Configure: | Exception Severity |
|-------------------------------------|-------------------------------|--------------------|

Group: Initiate Exception Processing
6.1 Highlight Info

Actor/Role: MDM

Description: MDM highlights information, if it comes across an exception of severity 'Info' during VEE Processing.

| |
|--|
| D1-INIT-VEE (Perform VEE for Initial Load IMD) |
| D1-MNOV-VEE (Perform VEE for Manual IMD) |

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-ESTM-VEE (Perform VEE for Estimation IMD) |
| | | D1-TRN-EXCP (Transition on Exception) |

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|----------------------------------|
| Configuration required (Y/N) | Entities to Configure: | Exception Severity for VEE Rules |
|-------------------------------------|-------------------------------|----------------------------------|

[6.2 Analyze Error and Work To Do](#)

Actor/Role: MDM Authorized User

Description: MDM Authorized User analyzes the error logged and respective To Do created to determine the corrective action. User performs work to resolve the error.

| | | |
|--------------------------------------|--------------------------------|-----------------------------|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-CRE-IMDTD (Create To Do) |
|--------------------------------------|--------------------------------|-----------------------------|

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

[6.3 Request to 'Discard'](#)

Actor/Role: MDM Authorized User

Description: When the IMD is in 'Exception' state and MDM Authorized User decides that the IMD cannot be used, can manually make request to discard it.

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

6.4 Complete To Do(s)

Actor/Role: MDM

Description: MDM find all non-completed To Do entries and completes them before reprocessing.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-COMP-TD (Complete To Do Entries for Initial Measurement Data) |
|--------------------------------------|--------------------------------|--|

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

6.5 Update IMD to 'Discard' State

Actor/Role: MDM

Description: MDM updates IMD to 'Discard' state indicating that it cannot be used further. However it remains in the system.

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

6.6 Request to 'Force Complete'

Actor/Role: MDM Authorized User

Description: When the IMD is in 'Exception' state and MDM Authorized User decides that the IMD should be 'Completed' despite of open Exceptions and corrections to be performed, User can manually make request to Force Complete it.

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |

6.7 Update IMD to 'Force Complete' State

Actor/Role: MDM

Description: MDM updates IMD to 'Force Complete' state.

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |

6.8 Request to 'Perform VEE'

Actor/Role: MDM Authorized User

Description: When the IMD is in Exception state and User could resolve the exception, User can decide to manually invoke VEE reprocessing immediately for the IMD by making a request to 'Perform VEE' to the system.

| Business Object (Y/N) | Business Object |
|-----------------------|---|
| | D1-InitialLoadIMDInterval |
| | D1-InitialLoadIMDScalar |
| | D1-ManualIMDInterval |
| | D1-ManualIMDScalar |
| | D1-EstimationIMDInterval |
| | D1-EstimationIMDScalar |

6.9 Update IMD to 'VEE' State and Continue Processing

Actor/Role: MDM

Description: MDM updates the IMD to VEE state and continues re-processing.

| | | |
|--------------------------------------|--------------------------------|--|
| Process Plug-in enabled (Y/N) | Available Algorithm(s): | D1-IMD-RETRY (Retry Initial Measurement Data Processing) |
|--------------------------------------|--------------------------------|--|

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

7.0 Evaluate Criteria to Run Automated Retry Process

Actor/Role: MDM

Description: Batch process is configured for this automated retry process. Batch parameters govern whether the processing is further restricted by batch code, business object, status, etc. This batch process invokes monitoring rules associated with the current state of IMD.

| | | |
|------------------------------|------------------------|---|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval |
| | | D1-InitialLoadIMDScalar |
| | | D1-ManualIMDInterval |
| | | D1-ManualIMDScalar |
| | | D1-EstimationIMDInterval |
| | | D1-EstimationIMDScalar |

| | | |
|-------------------------------------|-------------------------------|-----------------------|
| Configuration required (Y/N) | Entities to Configure: | Automated Retry |
| | | Retry until Date/Time |

7.1 Identify IMD in 'Exception' State

Actor/Role: MDM

Description: Batch Process continuously monitors to identify the IMD in 'Exception' state to start reprocessing. Currently, the Batch process used for reprocessing the IMDs in 'VEE Exception' is IMD Monitor - Physical Devices.

| | | |
|-------------------------------------|-------------------------------|--|
| Business Object (Y/N) | Business Object | D1-InitialLoadIMDInterval D1-InitialLoadIMDScalar D1-ManualIMDInterval D1-ManualIMDScalar D1-EstimationIMDInterval D1-EstimationIMDScalar |
| Configuration required (Y/N) | Entities to Configure: | Automated Retry Retry until Date/Time |
| Customizable process (Y/N) | Process Name | IMD Monitor - Physical Devices (D1-IMD) |

Test Documentation related to the Current Process

| ID | Document Name | Test Type |
|----|---------------|-----------|
| | | |
| | | |
| | | |

Document Control

Change Record

| Date | Author | Version | Change Reference |
|------------|----------------------|---------|---|
| 9/13/2011 | Srinivas Rao Kanteti | 1 | Initial Draft |
| 5/4/2015 | Srinivas Rao Kanteti | 2 | Revision (Included Meter Reader Remark Process) |
| 6/19/2015 | Srinivas Rao Kanteti | 3 | Revision (Updated VEE Process) |
| 8/24/2015 | Srinivas Rao Kanteti | 4 | Restructured VEE Rules Page based in feedback |
| 11/17/2015 | Walter Wolanski | | Review |
| 11/19/2015 | Galina Polonsky | | Review, Approve |

Attachments

Initial Load IMD Interval Lifecycle



Initial Load IMD
Interval Lifecycle.doc

Initial Load IMD Scalar Lifecycle



Initial Load IMD
Scalar Lifecycle.doc

Manual IMD Interval Lifecycle



Manual IMD Interval
Lifecycle.doc

Manual IMD Scalar Lifecycle



Manual IMD Scalar
Lifecycle.doc

Estimate IMD Interval Lifecycle



Estimate IMD
Interval Lifecycle.doc

Estimate IMD Scalar Lifecycle



Estimate IMD Scalar
Lifecycle.doc

Reader Remark Lifecycle



Reader Remark BO
Lifecycle

VEE Group for a MC



VEE Group for a
MC.doc

VEE Rules in a VEE Group



VEE Rules in a VEE
Group.doc

VEE Rule Lifetime



VEE Rule
Lifetime.doc

Referred VEE Group for VEE Rule



Referred VEE Group
for VEE Rule.doc

VEE Group Matrix for a VEE Rule



VEE Group Matrix for
a VEE Rule.doc

Error and To Do



Error and To Do.doc

Replacement Rule Configuration



Replacement Rule
Configuration