

MSATS Procedures: MDM Procedures

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Current version release details

Version	Effective date	Summary of changes
4.31	30 May 2023	Inclusion of RM51 for Standalone Power Systems. Clarification of the RM43 and RM46 reports
4.5	2 June 2024	Updated for National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021
4.6	1 September 2024	Removal of NSW Controlled Load Profile

Note: There is a full version history at the end of this document.

1. Introduction

1.1. Purpose and scope

This is the MSATS Procedure – MDM Procedures (Procedures) made under clause 7.16.2 of the National Electricity Rules (NER).

These Procedures have effect only for the purposes set out in the NER. The NER and the National Electricity Law prevail over these Procedures to the extent of any inconsistency.

1.2. Definitions and interpretation

1.2.1. Glossary

Terms defined in the *National Electricity Law* and the NER have the same meanings in these Procedures unless otherwise specified in this clause.

Terms defined in the NER are intended to be identified in these Procedures by italicising them, but failure to italicise a defined term does not affect its meaning.

The Retail Electricity Market Procedures – Glossary and Framework:

- (a) Is incorporated into and forms part of this Procedure; and
- (b) Should be read in conjunction with this Procedure.

1.2.2. Interpretation

This Procedure is subject to the principles of interpretation set out in Schedule 2 of the *National Electricity Law*

1.3. Related documents

Title	Location
Retail Electricity Market Procedures – Glossary and Framework	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering
CATS Procedures	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions
WIGS Procedures	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions
Metrology Procedure: Part A	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metrology-Procedures-and-Unmetered-Loads

Title	Location
Metrology Procedure: Part B	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metrology-Procedures-and-Unmetered-Loads
MDM File Format and Load Process	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metering-procedures-guidelines-and-processes
CATS Hints and Tips	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions
NMI Procedures	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metering-procedures-guidelines-and-processes
Service Level Procedure (MDP)	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metering-procedures-guidelines-and-processes
Service Level Procedure (MP)	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Metering-procedures-guidelines-and-processes
aseXML Guidelines	http://www.aemo.com.au/Electricity/IT-Systems/aseXML_standards
Introduction to MSATS	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions
Guide to MSATS Web Portal	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions
Guide to MSATS B2B	http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Retail-and-metering/Market-Settlement-and-Transfer-Solutions

2. Obligations

2.1. General Obligations

- (a) Data access - A Participant (other than AEMO) must not seek access through MSATS to the data pertaining to a *NMI* unless that person has, or had, a known and commercial relationship with the *NMI*.
- (b) Use of facility - A Participant (other than AEMO) must not use a facility provided in MSATS for a purpose other than allowed by these Procedures.
- (c) Timeliness - Participants must ensure that the transfer of data for *settlements* purposes is achieved in accordance with the Data Delivery Calendar.

2.2. AEMO

AEMO must:

- (a) Maintain the TNI records in MSATS including the assignment of each TNI to a Profile Area in MDM;

- (b) Input and update in MDM as appropriate, the *marginal loss factors* (MLFs) associated with the TNI Codes;
- (c) Register new *profiles* as defined by the *metrology procedure* and their sample *meters* if applicable;
- (d) Perform the *profile* calculation, *profile* application, and *settlements* aggregation process within MDM to provide *settlements ready data* to facilitate the issue of *settlement statements* in accordance with the Data Delivery Calendar.

3. MDM Functionality

3.1. Introduction

- (a) MDM comprises two broad areas of functionality – setup functionality and processing functionality. This section outlines the basic features of this functionality.
- (b) The setup functions are performed initially, whilst commissioning MDM, or as required.
- (c) The processing functionality is performed regularly as preliminary work to each *settlements* run.

3.2. Setup Functionality

3.2.1. Profile Areas

- (a) A Profile Area in MDM is defined by a list of TNIs that AEMO assigns to that Profile Area and is given a Profile Name.
- (b) Every TNI must be assigned to a Profile Area. The TNIs must be assigned to Profile Areas in accordance with the *metrology procedure*.
- (c) Initially, Profile Areas are based loosely on *distribution network* boundaries.

3.2.2. Types of Profiles

- (a) A *profile* can be broadly classified into two different types: NSLP and non-NSLP.
- (b) The only type of *profiles* that are used in MSATS are the 5MLP, NSLP, and the CLPs in NSW, QLD and SA. Each CLP is assigned a unique Profile Name.
- (c) Note that a dummy Profile Name of NOPROF (for no *profile*) has been created for interval Datastreams so that MSATS can enforce a requirement that all Datastreams have a Profile Name assigned to them.

3.2.3. Characteristics of the 5MLP

The 5MLP calculation process for each Profile Area can be summarised as follows:

- (a) Summate all of the *energy* of the defined system load datastreams for that Profile Area after adjusting the *energy* by the *marginal loss factor (MLF)* and all *distribution connected unit* interval Datastreams after adjusting for MLF and DLF.
- (b) Add the *energy* for all Cross Boundary inflows for that Profile Area adjusting the *energy* by the MLF and DLF.
- (c) Subtract the *energy* of all of the non-system load interval Datastreams where the electrical *energy* is measured or calculated in TIs for that Profile Area after adjusting the *energy* by the MLF and the DLF. These *metering installations* will have active interval Datastreams assigned to them in MSATS.
- (d) Subtract any non-interval (Accumulation Meter) Datastreams for that Profile Area that have non NSLP Profile Names tagged to be “peeled-off”. This requires the Accumulation Meter Datastreams’ *accumulated energy* to be converted to interval Datastreams by applying the non NSLP profile to the *energy* readings after adjusting the *accumulated energy* by the MLF and the DLF. This tagging is made when the CLP Profile Name is assigned to that Profile Area.
- (e) The 5MLP profile is applied to 15 and 30-minute interval Datastreams in accordance with Metrology Procedure: Part B Sections 12.4 and 12.5.

3.2.4. Characteristics of the NSLP

The NSLP calculation process for each Profile Area can be summarised as follows:

- (a) Summate all of the *energy* of the defined system load datastreams for that Profile Area after adjusting the *energy* by the MLF. Note this will include *distribution connected unit* interval Datastreams after adjusting *energy* by the MLF and DLF.
- (b) Subtract the *energy* of all of the non-system load interval Datastreams for that Profile Area after adjusting the *energy* by the MLF and the DLF. Note this will include any interval Datastreams profiled using 5MLP and any Accumulation Meters or unmetered *connection points* that have been profiled externally to MSATS (these *meters* will have active interval Datastreams assigned to them in MSATS).
- (c) Subtract any non-interval (Accumulation Meter) Datastreams for that Profile Area that have non NSLP Profile Names tagged to be “peeled-off”. This requires the Accumulation Meter Datastreams’ *accumulated energy* to be converted to interval Datastreams by applying the non NSLP profile to the *energy* readings after adjusting the *accumulated energy* by the MLF and the DLF. This tagging is made when the CLP Profile Name is assigned to that Profile Area.

3.2.5. NSLP Parameters

The NSLP uses a number of parameters to define how missing *metering data* is Substituted by MDM. The following table provides a description of the various parameters that can be defined when the NSLP is being set up.

PARAMETER	DESCRIPTION
Season Type	Each <i>profile</i> is assigned a Season Type model that divides the year into groups of time. In MDM a single season is used.
Day Type	Each <i>profile</i> is assigned a Day type model that divides a week into groups of time. In MDM a seven day type is used.
Date Exceptions	Date Exceptions are a set of days when the normal day types will not apply i.e. list of national public holidays. For example, for a holiday that falls on a weekday MDM can be configured to use the value from a weekend instead of the normal weekday profile. The exceptions and the day type to be applied on respective exceptions are configured in MDM.

3.2.6. Characteristics of CLPs

A CLP is defined by the relationship between a number of attributes. These attributes are:

- (a) A data source that defines the interval Datastreams to be used for calculation of the profile shape. This includes the period during which the *profile* is valid.
- (b) A **method** that defines how a data source is Substituted where no *interval metering data* exists.
- (c) A **name** that identifies the *profile* by linking the above attributes.

3.2.7. Non-NSLP Parameters

The following table provides a description of the various parameters that are defined when a *profile* method is being set up.

PARAMETER	DESCRIPTION
Season Type	Each <i>profile</i> is assigned a season type model that divides the year into groups of time. In MDM a single season is used.

PARAMETER	DESCRIPTION
Day Type	Each <i>profile</i> is assigned a day type model that divides a week into groups of time. In MDM a seven day type is used.
Date Exceptions	Date exceptions are a set of days when the normal day types will not apply i.e. list of national public holidays. For example, for a holiday that falls on a weekday MDM can be configured to use the value from a weekend instead of the normal weekday profile. The exceptions and the day type to be applied on respective exceptions are configured in MDM.

3.2.8. Settlement Data Scenarios

There are 4 basic types of Settlement Data Scenarios that are processed in MDM and the results are provided to MMS from which the *settlement statements* are calculated and posted. These are:

- (a) Preliminary (Posted from MMS in trading week + 5 *business days*)
- (b) Final (Posted from MMS in trading week plus 18 *business days*)
- (c) Routine Revision 1 (Posted from MMS in trading week + approximately 20 weeks) – denoted R20
- (d) Routine Revision 2 (Posted from MMS in trading week + approximately 30 weeks) – denoted R30.

3.2.9. Special Settlement Scenarios

In addition, Special Settlement Scenarios can be run when AEMO determines that a *special revised statement* is required to be calculated (e.g. as per clause 3.15.19 of the NER). These special runs will have parameters set for the objective of the run. For example, if at 24 weeks after the settlement week, it was determined that data used in the R20 run was incorrect a new scenario for that trading week could be run with data available at week 24.

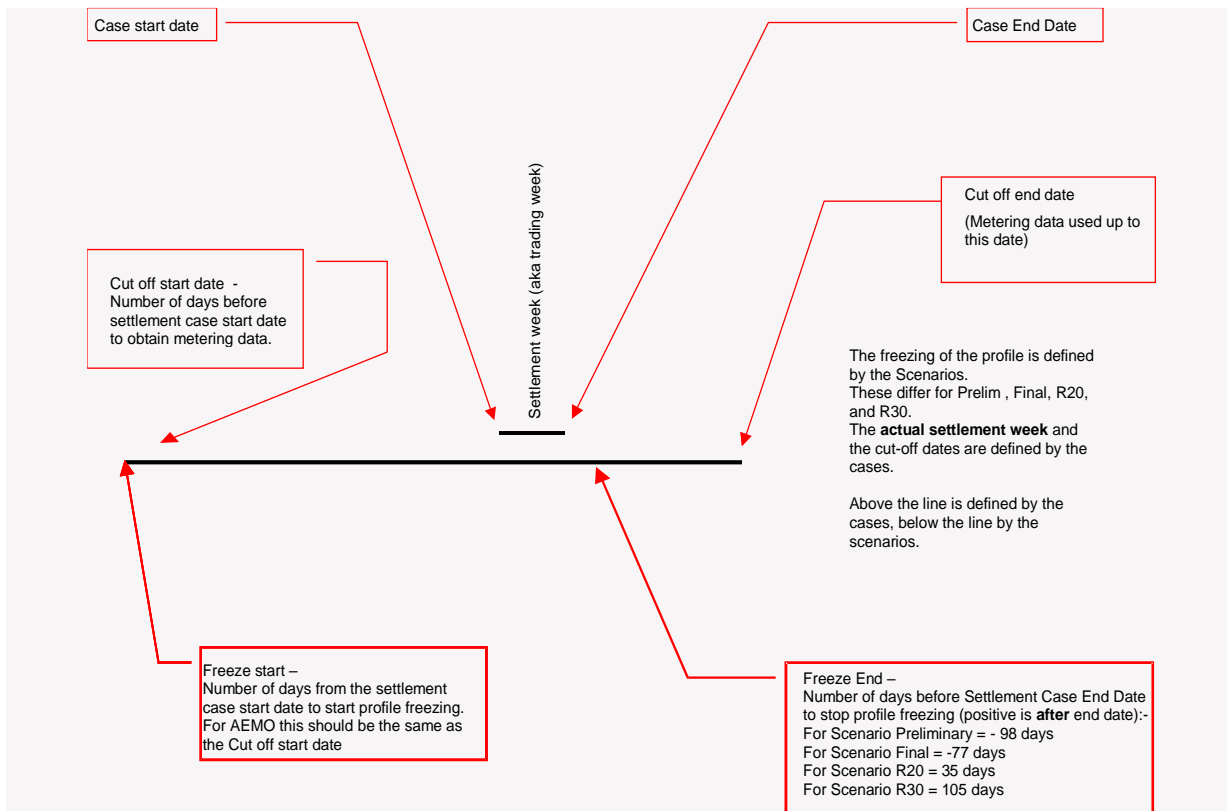
3.2.10. Parameters for Settlement Types

- (a) A scenario defines the basic parameters for that *settlements* type such as the length of time either side of the *settlements* period to freeze the *profile*.
- (b) The input parameters of a scenario include:
 - (i) Scenario Name
 - (ii) Scenario Type (as above)
 - (iii) *Profile* freeze cut-off period. This defines the period for which the system will freeze the 5MLP, NSLP and CLP profiles (currently set to 15 weeks).

3.2.11. Settlement Data Scenarios

- (a) The relationship between the date ranges used in creating the Settlement Data Scenario can be seen in the following diagram.

Figure 1 Example – R20 settlement



SCENARIO/PARAMETER	PRELIMINAR Y	FINAL	R20	R30
SCENARIO TYPE	PRELIM. RUN	FINAL RUN	ROUTINE REVISION 1	ROUTINE REVISION 2
Number of days before the Case End date to start freezing NSLP	393	379	267	197
Number of days before the Case End date to stop freezing NSLP	112	91	-21	-84
NSLP Calculation	Y	Y	Y	Y
Use Frozen NSLP Profile	Y	Y	Y	Y
Cut Off Start (number of days prior to Case Start Date to get metering data)	386	372	260	197
Cut Off End (number of days after Case End Date to get metering data)	0	14	126	189

- (b) A Settlement Data Scenario is like a folder that contains different Settlement Cases for a particular Settlement Type.
- (c) The input parameters of each Settlement Case include:
 - (i) 'Data As of Now'.
 - (ii) 'Data As Of Date/time' (data run based on data that existed at a defined point in time). This is not normally defined as generally the *settlements* case run will use the latest data available at the time that the case starts processing.

- (iii) Process cut off start/end date periods. This defines the boundaries of the oldest data date and the latest cut-off date for *metering data* used in the processing.
- (iv) Case start/end date (this is the *settlements* date range – normally one week).
- (v) Scheduled (whether run is to be run now or if it is to be scheduled). The Settlement Case begins to run automatically when the scheduled time is reached.

3.2.12. MDM Settlement Data Processing

- (a) Settlement Data Processing consists of profile calculation (called ‘Profile Preparation Service’ for CLP and NSLP), profile application (called ‘Basic Meter Profiling’ for non NSLP and NSLP) and *settlements* energy (load) aggregation.
- (b) For the purposes of *settlements ready data* processing, Datastreams can be categorised into four types. Different processes are applied to the respective types at different times during *settlements* data processing. These are:
 - (i) Interval Datastreams. These are all used in the NSLP calculation (i.e. all consumer data interval streams).
 - (ii) Non-Interval Datastreams that have a CLP Profile Name assigned and are peeled off during the NSLP calculations. These are used in the NSLP calculation.
 - (iii) Non-Interval Datastreams that have a NSLP profile type. These are only used in the *settlements* load aggregation process.
 - (iv) Non-Interval Datastreams that have a CLP Profile Name assigned and are not peeled off during NSLP calculations. These are only used in the *settlements* load aggregation process.

3.2.13. Processing Functionality

The purpose of this section is to provide an overview of the functionality and operation of the MDM Settlement Data Processing. This consists of a number of basic functional blocks that can broadly be described as a Profile Preparation Service, Basic Meter Profiling, and Load Aggregation.

3.2.14. Profile Preparation Service (PPS)

Create
Profile
Shape



A profile shape is used to derive TI level consumption of energy from an Accumulation Meter reading. The purpose of PPS is to prepare NSLPs with or without peel-off and to prepare non NSLPs.

The preparation of a profile shape is triggered when a settlement case begins to run. The process accepts a list of profiles and profile periods as inputs. For all input profiles, Profile Names are retrieved from MDM. For each Profile Name, profile data sources are identified and are validated against the CATS database (*NMI standing data*). After successful validation of the input data, PPS will invoke an appropriate algorithm (method) to calculate the profile shape data and store it in MDM. These generated profile shapes will be used to profile Accumulation Meter readings.

Profiles may also be generated externally and provided to MDM, for example, by an MDP.

Apply Profile Shape to Accumulation Meters

5. Basic Meter Profiling (BMP)

- (a) The purpose of BMP is to apply profile shape data to non-interval Datastream (Accumulation Meter) *metering data* to create five-minute profiled *interval metering data*. This is required for all Datastreams needed for NSLP Peel-off. The profile shape data may have been calculated by MDM or externally generated and delivered to MDM.
- (b) This process validates the existence of profile shape data for each Profile Name for the *settlements* period. If any data is missing, substituted values are calculated for the missing periods.
- (c) After the successful validation of profile shape data, all non interval Datastreams associated with the profile name are selected and validated for the existence of cumulative *metering data* for the *settlements* period. Any periods that are missing cumulative *metering data* are substituted by MDM. The cumulative *metering data* and the relevant Profile Shape data is used to generate *interval metering data* for *settlements* purposes.

3.2.16. Unaccounted for energy (UFE)

UFE for a *local area* is calculated by summing the *energy* flowing at all *transmission network connection points* into a *local area* then subtracting cross-boundary *energy* flows into an adjacent *local area*, adding cross-boundary *energy* flows from an adjacent *local area*, adding all *Market Generation energy* flows within the *local area* and subtracting all known *load energy* flows within the *local area*.

Note that for the purpose of UFE calculation, the *local area* is the Profile Area.

3.2.17. Settlement Load Aggregation

Aggregate Metering Data for Settlement Purposes

- (a) The purpose of the *settlements* load aggregation process is to take *metering data* from bulk supply and customer interval Datastreams, and customer *interval metering data* produced from the BMP process and to aggregate them by the FRMP, ENLR (where applicable), MDP, TNI, and Datastream type. Note that DLFs are applied in this process.
- (b) This aggregated data is then further aggregated by the FRMP, ENLR (where applicable), and TNI and then loaded into AEMO's *settlements* system. Non-aggregated *generation* data is also loaded into AEMO's *settlements* system.

3.2.18. Processing Overview

- (a) The normal weekly process will consist of 4 *settlements* runs. Additional runs may be performed on an ad-hoc basis.
- (b) The *settlements ready data* processing task is initiated by establishing and scheduling a 'Settlement Data Case'. An outline of the process is as follows:

Step 1: When the scheduled start time of the 'Settlement Data Case' is reached the process commences by initialising all tables it requires.

Step 2: The system initialises the NSLP process to determine the NSLP shape for the Profile Areas.

Steps 3 to 8 outline how the NSLP calculation is performed.

Step 3: Create the profile shapes for the CLPs that are to be peeled off during the NSLP calculation and the 5MLPs. This process works out what profiles need to be created and for what period they are needed. The system uses data sources to create the profile

shape (these are defined as part of the setup of the profile as detailed in section 3.2.4 and 3.2.6). For each TI it looks to see if a corresponding value exists within the data source. If any *metering data* does not exist in the system, MDM will calculate a substitute for the data source.

Step 4: The next step is to calculate the Usage Factors for the non-interval Datastreams that are to be included in the NSLP peel off calculation (i.e. with a Profile Name that is not NSLP). Usage Factors are calculated by dividing the Datastream's cumulative *energy* by the sum of the interval values for the profile shape over that cumulative *energy*'s start and end date range. If cumulative *energy* is not available for the calculation period, MDM will calculate a Substitute. The cumulative *energy* value could be supplied by the MDP as either an Actual Meter Reading or Substitute or Estimate. It is at this point that the DLF is applied.

Step 5: The system will then check active interval Datastreams for missing data from MDPs. Where a previous MDM-stored Substitute exists, this will be used. Where no previous MDM-stored Substitute exists and the interval datastreams' *metering data* is not available or profile shape interval data is not supplied, the system will use a proxy day profiling methodology to substitute the *energy* for profiling and *settlements* purposes. The proxy day will select values from the most recent day of the same day type and season type as the day being modelled. If no Historical Data is available, the system will use ADL divided by 288 for each TI. The system will then store the *substituted metering data* in the table as an MDM Substitute for use in future *settlements* runs (**Case ID**).

Step 6: After missing *metering data* has been Substituted by MDM, the system will work out the interval consumption load for each non-interval Datastream. This is done by applying the Usage Factor created in step 4 for each Datastream to the profile shape data value for the same period created in step 3.

Step 7: The system will then aggregate the data to derive the NSLP shape for each Profile Area. The NSLP shape will be calculated from the earliest non locked down profile period to the cut-off end date as defined in the Case ID. Once derived, the NSLP shape is stored in the MDM.

Step 8: After the NSLP shape has been calculated the *settlements* load aggregation process will be undertaken. This follows a similar process to the NSLP process and commences with substituting load for non-interval Datastreams.

Step 9: The next step in the final aggregation is to calculate Usage Factors for all non-interval Datastreams that were not included in the NSLP calculation. How Usage Factors are calculated is discussed further in Step 4. In addition, the DLF will be applied at this step.

Step 10: Next, the system will calculate the Accumulation Meter interval load for each non-interval Datastream by applying Usage Factors to the profile shape values that corresponds to that Datastream's assigned Profile Name

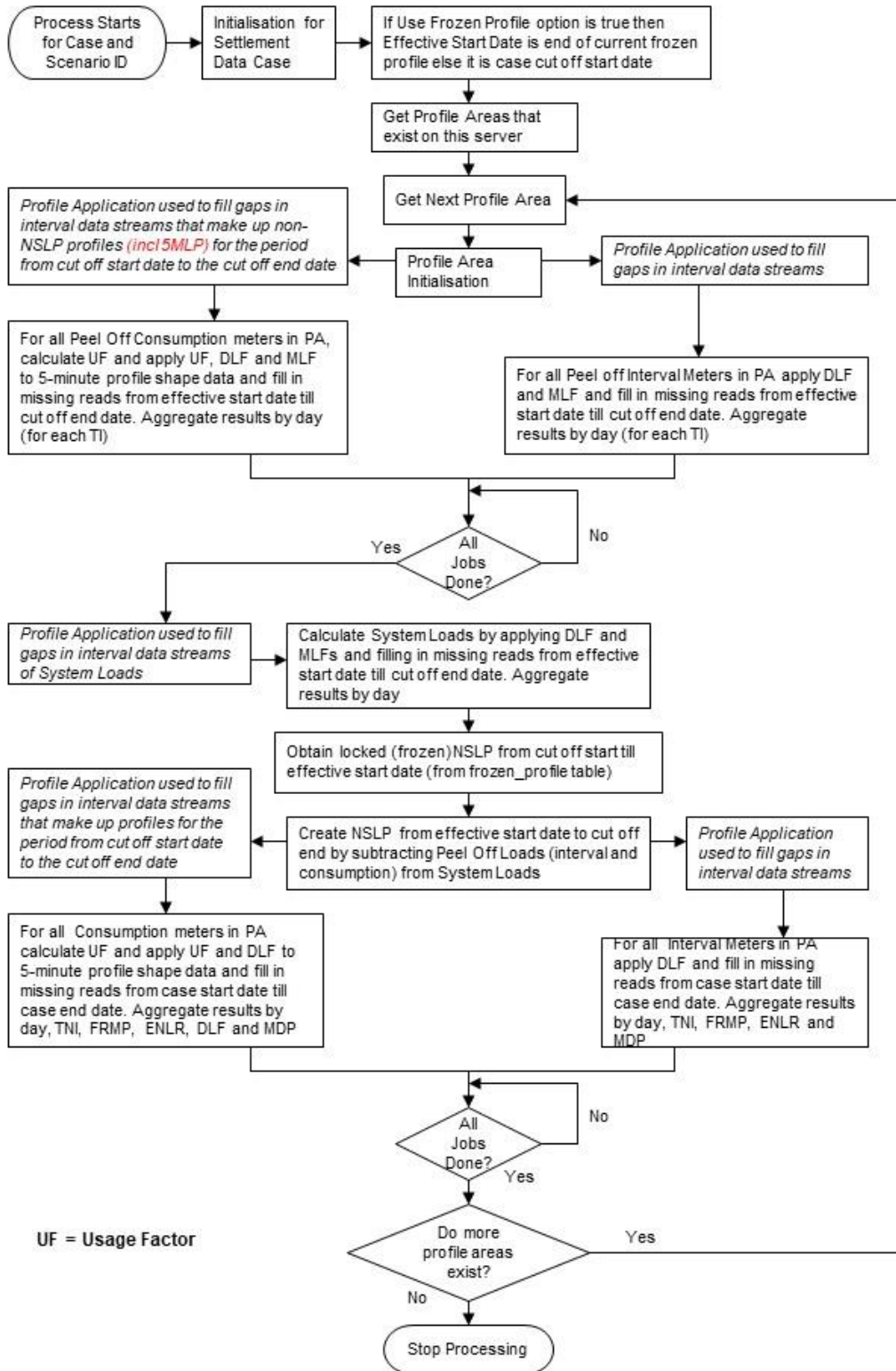
Step 11: UFE is calculated for a *local area* by summing the *energy* flowing at all *transmission network connection points* into a *local area* then subtracting/adding cross-boundary *energy* flows into/from an adjacent *local area*, adding all *Market Generation*

energy flows within the local area and subtracting all known load energy flows within the local area.

Step 12: Finally, the system will aggregate data for all bulk supply and customer *load* Datastreams. These may be interval or non-interval Datastreams. The output from the load aggregation run is stored in MDM using load aggregation scenario and case as a unique identifier. It stores data for End User load and *interconnectors* aggregated at TNI, FRMP, ENLR (where applicable), MDP and Datastream type level. It will also collect non aggregated data for *Generators*.

Step 13: The output from the final step will be placed in interface files for loading into AEMO's *settlements* system.

Figure 2 Process Flow Diagram for a Settlement Data Case



4. Maintenance of TNI and Profile Area

4.1. Introduction

- (a) This section outlines the information that is required by MSATS to create and maintain Profile Areas. This function can only be performed by AEMO.
- (b) The creation and maintenance of a TNI is performed in the CATS section of MSATS. The creation of a Profile Area and maintenance of Profile Area attributes is performed in the MDM section of MSATS.

4.2. Create a Profile Area

- (a) If a Jurisdiction Code and TNI Code have been entered into CATS and MDM, AEMO must provide the following information:
 - (i) The name of the Profile Area.
 - (ii) The start date for the Profile Area.
 - (iii) The end date for the Profile Area (normally 31/12/9999).
 - (iv) The TNIs that will be assigned to the Profile Area.
- (b) AEMO may edit the dates for which a TNI will be applicable for a Profile Area (by default all TNI dates are set to the Start and End dates for the Profile Area).

4.3. Maintain Profile Area Attributes

For a Profile Area (viewable from the “Profile Area – List” screen under Profile Preparation section of browser), AEMO must input some of the following information:

- (a) The revised end date for which the Profile Area is to be valid; or
- (b) The revised list of TNIs that will be associated with the profile Area.

5. Load data – non-interval NMI datastream

5.1. Conditions Precedent

Any submitted data that has a version datetime equal to or earlier than any data that already exists in MDM will be rejected.

5.2. MDP Obligations

For any active non-interval NMI Datastream in CATS, the MDP must:

- (a) Where there is one or more existing *metering data* records for the Datastream, ensure that the start date of the data being loaded aligns with the end date of the existing record (start date equals previous record end date plus one).
- (b) Submit an aseXML message containing the *metering data* csv payload for the specific NMI Datastream and *settlements* date. The message will include nomination of:
 - The date of submittal of the data
 - NMI
 - Datastream Suffix
 - The data From Date
 - The data To Date
 - MDP
 - MDP version datetime
 - Energy Value in kWh units
 - Quality/Status flag
- (c) Update CATS DataStreamType to “C” where Basic Datastream included in NEM *settlements* calculation.

6. Load data – interval NMI datastream

6.1. Conditions Precedent

Any submitted data will be validated and may be rejected to ensure AEMO has the latest version of *metering data*.

6.2. MDP Obligations

For any active interval NMI Datastream in CATS, the MDP must:

- (a) Submit an aseXML message containing the *metering data* csv payload for the specific NMI Datastream and *settlements* date. The message will include nomination of:
 - The date of submittal of the data
 - NMI
 - Datastream Suffix
 - *Settlements* Date
 - MDP
 - MDP version datetime
 - Energy Values in kWh units
 - Quality/Status flag for each interval of the data
- (b) Update CATS DataStreamType:
 - (i) “I” where Interval Datastream included in NEM *settlements* calculation,
 - (ii) “N” where Interval Datastream is NOT included in NEM *settlements* calculation or NEM Profile calculation

6.3. Load Sample Meter Data for defined NMI Datastreams

The process for loading sample *metering data* is similar to “Load Data – Interval NMI Datastream”. The only difference is that the Datastream type defined in CATS is “P”.

6.4. Load Externally Calculated Profile Shape

The process for loading external profile shape data is similar to “Load Data – Interval NMI Datastream”. The only difference is that the Datastream type defined in CATS is “P”.

7. Define profile

7.1. Define the Data Source

- (a) If the appropriate data source NMI Datastreams do not exist they must first be defined in CATS (refer CATS Procedures) before this procedure can be implemented.
- (b) If there is an active list of NMI Datastream data sources in CATS, AEMO must provide the following information:
 - (i) Data source name
 - (ii) Sampling period start date that is not earlier than the current system date.
 - (iii) Sampling period end date that is not earlier than the start date (normally set to 31/12/9999).
 - (iv) At least one *NMI* and suffix that identifies data to be used for calculation of the profile shape.
 - (v) Weight for each *NMI* and associated suffix, as a numeric value between 0.00 and 1.00.

7.2. Define the Profile Method

MDM has been set up to use only one *profile* methodology. This is the seven-day type methodology.

7.3. Define the Profile Name

If:

- (a) the Jurisdiction has approved the creation of the proposed profile; and
- (b) the data source(s) and profile method have been defined,

AEMO must provide the following information:

- (c) A unique Profile Name
- (d) Start date
- (e) Profile method name
- (f) Data source name
- (g) Applicable Profile Areas, and

AEMO may provide an end date that is not earlier than the start date. The screen will default the end date to the high date (31-Dec-9999).

8. Profile calculation

8.1. Settlement Data Scenario

The purpose of this section is to define the parameters that are required to create *settlements ready data*. This involves the creation of Settlement Data Scenarios that identify the relationship between key parameters.

8.1.1. Creating a New Settlement Data Scenario

To create a New Settlement Data Scenario, AEMO must provide the following information:

- (a) The Settlement Data Scenario Name, which must be unique.
- (b) The Settlement Data Scenario Type.
- (c) The number of *days* before the Case End Date to start freezing the NSLP.
- (d) The number of *days* before the Case End Date to stop freezing the NSLP.
- (e) Whether the NSLP is to be calculated in this Settlement Data Scenario.

8.1.2. Editing a Settlement Data Scenario

- (a) A Settlement Data Scenario may be edited by the AEMO user who created the Scenario, by the system administrator, or by AEMO super users.
- (b) Conditions precedent are:
 - (i) A Settlement Data Scenario has been selected
 - (ii) No cases/runs have been processed under this scenario
- (c) To edit the Settlement Data Scenario the following information must be provided:
 - (i) The Settlement Data Scenario Type
 - (ii) The number of *days* before the Case End Date to start freezing the NSLP
 - (iii) The number of *days* before the Case End Date to stop freezing the NSLP
 - (iv) Whether the NSLP is to be calculated in this Settlement Data Scenario

8.1.3. Deleting a Settlement Data Scenario

- (a) A Settlement Data Scenario may be deleted by the AEMO user who created the Scenario, by the system administrator, or by AEMO super users.
- (b) Conditions precedent are:
 - (i) A Settlement Data Scenario has been selected
 - (ii) No cases/runs have been processed under this scenario

8.2. Settlement Data Cases

The purpose of this section is to define the parameters that are required to establish a Settlement Data Case.

If the scenario to be used has been defined, AEMO must provide the Settlement Data Scenario under which the Case should be run.

AEMO may edit a Settlement Data Case by providing the same information as required for when a Settlement Data Case is created as long as the Settlement Data Case is uncommitted (not scheduled). Once the Settlement Data Case has been committed, an edit is not possible.

9. Reports

9.1. Introduction

This section describes the reports from MDM that are available to Participants. More information can be found in the Participant User Interface Guides to MSATS.

The reports identify the participant roles to which a participant must have an assignment to receive the report. Only parties with active assignments to the NMI for the reporting period will be displayed in the report results.

Access methods for each report are detailed for each report:

- Request –nominated participant roles can request the report via their preferred method.
- Subscription – a participant who has registered to automatically receive the report
- Push – the report will automatically be sent to the nominated participant roles.

Notes:

- AEMO will provide all reporting results for each report request, therefore the “LastSequenceNumber” has been updated from mandatory to optional in the aseXML schema r39. AEMO will no longer reference this field when processing MDM report requests. AEMO recommend participants populate this field with the numerical value = ‘0’.
- AEMO will continue to generate report results with the ‘SeqNo’ (in the .csv payload) to reflect the number of rows within an RM Report.
- To produce a sample of the report results the MaximumRows field within the aseXML schema can be used. If the MaximumRows field is populated all results will be provided up to the value populated, the remaining values will be discarded.

9.2. MDM RM9 – Actual Versus Estimate Data Report

The purpose of the MDM RM9 Actual Versus Estimate Data report is to allow AEMO and Participants to compare the number of Estimates and Actual Meter Readings in the system used for settlements. The output is for either Accumulation Meters or Interval Meters and can be further restricted to only those Meter Readings supplied by a particular MDP.

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, FRMP, ENLR, MDP.

Information that must be submitted with the report request:

- Start date and end date
- Data type, whether interval or accumulation (non-interval)
- The ‘As at’ date and time for the data being requested

Information that may be submitted with the report request:

- The MDP. This limits the report to records related to this MDP.

- The last sequence number. (Not Used by AEMO)

Report Outputs:

- MDP
- Settlement Date
- Count of number of non actual reads

Example: settlement day where any data quality does not equal 'A')

- Count of total number of reads
- Percent (%) of non actual reads
- Report sequence number

9.3. MDM RM11 – Missing Data Report

The purpose of the MDM RM11 Missing Data report is to allow AEMO and Participants to find out what *metering data* is missing from MDM. Includes all active NMI Data Streams registered in MSATS.

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, FRMP, ENLR, MDP.

Push: MDP

Information that must be submitted with the report request:

- Start date and end date
- NMI (Optional)
- MDP
- The 'As at' date and time for the report being requested (only used if NMI is specified)
- Whether *interval metering data* or *accumulation metering data* is required
- NMI selection, all NMIs

Information that may be submitted with the report request:

- The last sequence number. (Not Used by AEMO)

Report Outputs:

- MDP
- Settlement date
- NMI
- Suffix
- Report sequence number

9.4. MDM RM13 – NMI Datastreams History Report

The purpose of the MDM RM13 NMI Datastreams History Report is to allow AEMO and Participants to retrieve the history of a NMI Datastream's *metering data* for a specified period.

This report will return all versions of *metering data* that exist in the system for that *NMI* for days within the report period.

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than 1000 days into the future.

Parties that have access to the report:

Request: AEMO, MC, FRMP, ENLR, LNSP, ENM, NSP2, MPB, MPC, MDP.

Information that must be submitted with the report request:

- Start date and end date
- Data type, whether interval or accumulation (non-interval)
- NMI
- The 'As at' date for the data being requested

Information that may be submitted with the report request:

- The last sequence number. (Not Used by AEMO)

Report Outputs:

- Settlement Date (for Interval Meters) or Start Date and End Date (for Accumulation Meters)
- NMI
- Suffix
- Load Time
- MDP Version Date
- MDP
- Value(s) – will be updated to allow the display of 4 decimals to support reads provided in MDFF Format.
- Read type flag(s)
Report sequence number
- Actual or Historical data identifier

9.5. MDM RM16 – Level 1 Settlement Reconciliation Report

The MDM RM16 Level 1 Settlement Reconciliation Report aggregates DLF adjusted *interval metering data* grouped by TNI, FRMP, ENLR, MDP, and Datastream type that was used during a *settlements* run. Source data for this report includes data supplied by an MDP and that produced as an output of a *settlements* run and includes data from interval Datastreams and accumulation Datastreams, but excludes *metering data* related to *NMIs* with *AggFlag* = N.

Participants can register to have the Profile name included in the report results.

Parties that have access to the report:

Request: AEMO, FRMP, ENLR, and MDP.

Push: FRMP, ENLR

Information that must be submitted with the report request:

- Settlement Case ID. Defines the required settlement run.

Information that may be submitted with the report request:

- Start date and end date. If the Start date and end date is not provided, data will be provided covering the entire period defined by the Settlement Case ID.
- The last sequence number. (Not Used by AEMO)

Report Outputs:

- TNI
- Datastream type
- FRMP, ENLR, MDP
- Profile name – only displayed for registered Participants
- Creation date/time
- Settlement date
- Data for Period 1 through to Period 288
- Report sequence number

9.6. MDM RM17 – Level 3 Settlement Reconciliation for Non-Aggregated Data

The MDM RM17 Level 3 Settlement Reconciliation for Non-Aggregated Data Report provides interval data for all suffixes of a particular *NMI* that was used during a *settlements* run. Source data for this report includes data supplied by an MDP and that produced as an output of a *settlements* run and includes data from interval Datastreams and accumulation Datastreams.

The read type flag for accumulation data will be changed as part of 5 minute settlements from 'P' prorated to 'A' where reads are provided by an MDP or 'E' where AEMO has estimated the reads.

The read type flag for interval data estimated by AEMO will change from 'P' to 'Z'

When a settlement value is a calculation of multiple reads (e.g. $N = E - B$) the MDP Version Date will display the latest reading timestamp.

Parties that have access to the report:

Request: AEMO, FRMP, ENLR, and MDP.

Information that must be submitted with the report request:

- NMI. This limits the output to suffixes of this NMI.
- Settlement Case ID. Defines the required settlement run.

Information that may be submitted with the report request:

- Start date and end date. The default is the entire period defined by the Settlement Case.
- The last sequence number. (Not Used by AEMO)

Report Outputs:

- Settlement date

- NMI and suffix
- Creation date/time
- Data for Period 1 through to Period 288
- Read type flags
- MDP Version Date
- Report sequence number

9.7. MDM RM20 – PPS Report

The purpose of the MDM RM20 PPS Report is to allow AEMO and Participants to retrieve profile shape data. It will return all NSLP, CLP and 5MLPs that cover each Profile Area in a *settlements* run. The output can be limited to those profiles used in a case run or by Profile Name.

Participants can manually request profiles for

- Case Id – returning all profile data for the settlement case including 2 weeks of frozen profile
- Start date and End date – returning profile data for all case ids for the period specific (maximum 7 days)

Subscription to this report will automatically provide all calculated profile data and 2 weeks of frozen profile data for each settlement run.

Parties that have access to the report:

Request: AEMO, MC, FRMP, ENLR, LNSP, ENM, NSP2, MPB, MPC, MDP

Subscription: FRMP, ENLR

Information that must be submitted with the report request:

- Either Case ID or start date and end date
- Start date and end date, compulsory if Case ID is not supplied.
- The 'As at' date and time for participant provided 'EPROFILE'

Information that may be submitted with the report request:

- Start date and end date, if Case ID is supplied.
- Settlement Case ID. Limits output to that case.
- Profile name. Limits output to that profile.
- The last sequence number. (Not Used by AEMO)
- MDP Version used to define the 'EPROFILE' version to be reported.

Report Outputs:

- Profile name
- Profile area
- Settlement date
- Load time/Creation time
- Data for Period 1 through to Period 288
- Report sequence number
- Locked
- Settlement Case

9.8. MDM RM21 - Level 2 Settlement Reconciliation Report (RM27 report for AEMO's use only)

For a *settlements* run the MDM RM21 - Level 2 Settlement Reconciliation Report will provide the daily totals of DLF adjusted *interval metering data* for each TNI's (supplied as an input) *NMIs*. The *NMIs* returned are restricted to those *NMIs*, including *metering data* related to *NMIs* with *AggFlag = N*. This report will provide the daily totals of DLF adjusted *interval metering data* for all *NMIs* for all TNI combinations for MDPs.

Where an ENLR is supplied as an input to this report, the *NMIs* returned are restricted to those *NMIs* that have the same ENLR. The output can also be further restricted to those *NMIs* with a certain MDP.

The MDM RM21 Level 2 Settlement Reconciliation Report will be produced on approval of a Settlement Case. The RM27 report is produced for AEMO's use only and is identical to the RM21 report.

Parties that have access to the report:

- Request: AEMO MDP, FRMP or ENLR
- Subscription: FRMP or ENLR

Information that must be submitted with the report request for the RM21 report:

- Settlement Case ID
- TNI
- ENLR

Information that may be submitted with the report request for the RM21 report:

- Start date and end date
- MDP. Further limits the output to *NMIs* associated with the specified MDP.
- The last sequence number. (Not Used by AEMO)

Report Outputs:

- TNI
- ENLR
- MDP
- *Settlements* date
- *NMI*
- DataStream Type
- MSATS Substitution Indicator
- Daily total energy
- MDP Version Date
- Report sequence number

9.9. MDM RM22 – Data Estimation Report

The purpose of the MDM RM22 Data Estimation Report is to allow AEMO and Participants to obtain details of Substitutions that have been made during a *settlements* run for missing *interval metering data* and Accumulation Meter readings

Parties that have access to the report:

- Request: AEMO, MDP, FRMP or ENLR

Information that must be submitted with the report request:

- Settlement Case ID

Information that may be submitted with the report request:

- Start date and end date. The default is the entire period defined by the Settlement Case ID.
- The last sequence number. (Not Used by AEMO)

Report Outputs:

- Settlement Date
- *NMI* and suffix
- Creation date time
- Substituted value for each interval
- Report sequence number

9.10. MDM RM25 – Settlement – Profile Shape Data

The purpose of the MDM RM25 Settlement – Profile Shape Data is to provide Participants with the profile shapes frozen by AEMO. It will return all NSLP, CLP and 5MLP that cover each Profile Area for each frozen profile week.

This report is automatically produced by AEMO and published to the AEMO website.

Parties that have access to the report:

All Participants from the AEMO website

Information that must be submitted with the report request:

The report cannot be requested by participants.

Report Outputs:

- Profile name
- Profile area
- Settlement date
- Load time/Creation time
- Data for Period 1 through to Period 288
- Report sequence number
- Locked
- Settlement Case

9.11. MDM RM26 - MDP Substitution and Estimation Report

The purpose of the MDM RM26 MDP Substitution and Estimation Report is to allow AEMO and MDPs to obtain details of Substitutions and Estimations that are still current in MDM for a specified settlement week.

The report start date cannot be greater than 400 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, MDP

Push: MDP (for R1 and R2 settlement weeks)

Information that must be submitted with the report request:

- Start and end dates
- Whether *interval metering data* or *accumulation metering data* is required

Report Outputs:

Interval Metering Data

- NMI and suffix
- *Settlements Date*
- FRMP
- ENLR
- MDP
- FLAG

Accumulation Metering Data

- *NMI* and suffix
- Start and end date
- FRMP
- ENLR
- MDP
- FLAG
- kWh

9.12. MDM RM37 – High Priority Missing Data Report

The purpose of the RM37 – High Priority Missing Data report is to allow AEMO, FRMP and MDP participants to identify missing readings for Transmission connection points and cross boundary meters required for each settlement day. The report will be pushed to MDPs daily

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, FRMP, MDP

Push: MDP

Information that must be submitted with the report request:

- Start date and end date
- MDP
- The 'As at' date and time for the report being requested (only used if NMI is specified)

Report outputs:

- MDP
- SettlementDate
- NMI
- Suffix
- Report sequence number

9.13. MDM RM38 – DataStream Missing Data Report

The purpose of the RM38 – Datastream Missing Data report is to allow AEMO, FRMP and MDP participants to identify missing Datastream readings required for the calculation of the Net (N) datastream for the settlement week to support the Data Delivery calendar. The report will be pushed to MDPs.

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, FRMP, MDP

Push: MDP

Information that must be submitted with the report request:

- Start date and end date
- NMI
- MDP
- The 'As at' date and time for the report being requested (only used if NMI is specified)

Report outputs:

- MDP
- SettlementDate
- NMI
- Suffix
- Report sequence number

9.14. MDM RM39 – Mismatch Data Report

The purpose of the RM39 – Data Mismatch report is to allow AEMO, FRMP and MDP participants to identify Datastream readings that have been received for a settlement week to support the Data Delivery calendar, where the Datastream does not have corresponding NMI Standing Data. The report will be pushed to MDPs.

The report start date cannot be greater than 1000 days in the past and end date cannot be greater than the request date (today), with a maximum date range of 7 days.

Parties that have access to the report:

Request: AEMO, FRMP, MDP

Push: MDP

Information that must be submitted with the report request:

- Start date and end date
- NMI
- MDP
- The 'As at' date and time for the report being requested (only used if NMI is specified)

Report outputs:

- MDP
- SettlementDate
- NMI
- MeterSerialNumber
- Suffix
- MDPVersion Date/Time
- Error Type (example: NMI, Datastream, MDP)
- Report sequence number

9.15. MDM RM43 – UFE Factor Values by Profile Area

The purpose of the RM43 – UFE Factor Values by Local Area report is to provide AEMO FRMP and LNSP Participants with the UFE Factor for each TI for each Local Area for each settlement run.

Parties that have access to the report:

Request: AEMO, FRMP or LNSP

Subscription: FRMP

Information that must be submitted with the report request:

- CaseID
- Profile Area

Report outputs:

- Case Id
- Settlement Type
- Local Area
- Settlement Date
- Creation Date
- UFEF values for Period 1 through to Period 288
- Report sequence number

9.16. MDM RM46 – UFE Validation Report

The purpose of the RM46 –UFE Validation report is to provide AEMO, FRMP and LNSP participants with the UFE components and the energy values used to calculate the UFE Factor for each TI for each Local Area within a settlement run.

Parties that have access to the report:

Request: AEMO, FRMP or LNSP

Subscription: FRMP

Information that must be submitted with the report request:

- CaseID
- Profile Area

Report outputs:

- Case Id
- Settlement Type
- Local Area
- Settlement Date
- Creation Date
- Data Type (“TME”, “DDME”, “ADME”, “UFE”, “ADMELA”, “UFEF”)
- Data for Period 1 through to Period 288
- Report sequence number

9.17. MDM RM51 – Regulated SAPS Generator Reconciliation

The purpose of the RM51 – Regulated SAPS Generator Reconciliation report is to provide MSRP (FRMP) participants with the energy volume determined to be contributed by the SAPS generator for each individual regulated SAPS. Allocation of energy values for this report will only be provided for approved Settlement Cases.

The energy values determined for each SAP generator will consist of:

TOTAL_LOAD – the aggregate net energy value or all SAPS end user NMI's for each TI

- In the case where there is missing metering data for all SAPS end user NMI's, TOTAL_LOAD will be calculated as 0.

CONT_RATIO – the proportion of energy generated by a SAPS generating unit contributing to TOTAL_LOAD for each TI

- In the case where multiple SAPS generating units are contributing to TOTAL_LOAD, the CONT_RATIO for each SAPS generating unit will be determined by the proportion of generated energy contributed by each SAPS generating unit for each TI.
- In the case where a single SAPS generating unit supports TOTAL_LOAD, the CONT_RATIO equals 1 for each TI.
- In the case where a SAPS generating unit consumes energy, the CONT_RATIO equals 0 and the load values will be included in the TOTAL_LOAD for the affected TIs.
- In the case where missing metering data is provided for a SAPS generating unit the CONT_RATIO will be set to 0 for the TIs where there is missing metering data.
- In the case where missing metering data is provided for all SAPS generating units the CONT_RATIO will be proportioned equally across each active SAPS generator

CALC_ALLOC – the calculated metering data for a SAPS generator for each TI is determined by multiplying the CONT_RATIO by the TOTAL_LOAD.

Subscription to this report will automatically provide the report for each approved Settlement Case.

Parties that have access to the report:

Request: AEMO or FRMP

Subscription: FRMP

Information that must be submitted with the report request:

- CaseID

Information that may be submitted with the report request:

- Profile Area
- TNI
- NMI

Report outputs:

- Case Id
- Settlement Type
- Profile Area
- TNI
- NMI
- Settlement Date
- Creation Date
- Null Data – indicates if the calculated value includes missing metering data
- Data Type (“Total_Load”, “Cont_Ratio”, “Calc_Alloc”)
- Data for Period 1 through to Period 288
- Report sequence number

Appendix A. MDM Data Load Transaction Process

Following is a summary of the transactions for each participant in a metering data exchange to MDM, via FTP, in order of operation.

ROLE	SCENARIO ACTIONS	VERIFICATION TASKS
MDP	MDP to submit aseXML message (within a zip file) containing the csv metering data payload for the specified NMI datastream and settlement date into their inbox	Confirm that acknowledgments have been received (.ack file written to outbox with same file name)
MSATS	Message receipt and transaction receipt .ack file created	.ack file written to MDP outbox with same file name as input zip file. If the zip file is submitted via the browser the acknowledgement response is received on the browser.
MDP	Delete .zip file from inbox	.zip file deleted from inbox
MSATS	Remove ack file from inbox	.ack file is deleted from outbox
MSATS	Second level validation .zip file produced	.zip file written to MDP outbox
MDP	MDP downloads copy of transaction receipt validation .zip file and acknowledges file	ack file written to MDP inbox with same file name as input zip file (if acknowledged via browser this step may be omitted)
MSATS	Delete .zip file from participant outbox	zip file is deleted from outbox
MDP	Remove ack file from inbox	ack file is deleted from inbox

Summaries of messaging exchange for MDMT transaction group (i.e. MDM Format) using delivery methods, including API, can be found in sections 4.1 and 4.2 of the MDM File Format and Process Load document.

Summaries of messaging exchange for MTRD transaction group (i.e. MDFF Format) using delivery methods, including API, can be found in sections 4.3 and 4.4 of the MDM File Format and Process Load document.

Version release history

Version	Effective Date	Summary of Changes
1.0	29 July 2004	Final Determination
2.0	3rd Sept 2007	Updated reference to Rules from Code and other minor changes and the introduction of FRC in Queensland
3.0	13th May 2009	Updated to include the NSP2 role for reports and the inclusion of the RM26 Substitution and Estimation Report
3.1	20th August 2009	Minor updates to reflect the change in governance from NEMMCO to AEMO. No content change
3.2	6th December 2010	Minor Changes to the “Processing Overview” section 3.3.4 to reflect the changes in MDM process to store and use previous substituted calculated data. Addition of the Data Collection Type Code to Section 6.
3.3	1 December 2017	Updated to incorporate: <ul style="list-style-type: none"> National Electricity Amendment (Expanding competition in metering and related services) Rule 2015. No.12; National Electricity Amendment (Embedded Networks) Rule 2015 No. 15; and National Electricity Amendment (Meter Replacement Processes) Rule 2016 No. 2.
4.0	1 October 2021	Updated to incorporate: National Electricity Amendment (Five Minute Settlement) Rule 2017 No.15 and National Electricity Amendment (Global settlement and market reconciliation) Rule 2018 No. 14
4.1	1 October 2021	<ul style="list-style-type: none"> Added description of 5-minute profile (5MLP) application to 15 and 30-minute metering data Added detail of RM25 and RM46 Reports Identifies how parties can access RM Reports
4.2	1 May 2022	Updated to reflect inclusion of Cross Boundary inflow to a Profile Area in the NSLP calculation
4.3	1 May 2022	Consolidated v4.0, 4.1 and v4.2.
4.31	30 May 2023	Inclusion of RM51 for Standalone Power Systems. Clarification of the RM43 and RM46 reports
4.5	2 June 2024	Updated for National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021
4.6	1 September 2024	Updated for removal of NSW Controlled Load Profile

Earlier versions are available by contacting the AEMO Support Hub at supporthub@aemo.com.au or call 1300 236 600.