MSATS 46.96 Technical Specification - 5MS - Meter Data

~~1.01~~1.02 Final November 2019

Release series: 5MSMETERINGJUL2021

Important Notice

PURPOSE & AUDIENCE

This document describes the technical changes required to participant's systems for the 5MS Meter Data stream (Release). The Australian Energy Market Operator (AEMO) provides this information as a service targeting business analysts and IT staff in participant organisations. It provides guidance about the changes to their market systems under the National Electricity Rules (Rules), as at the date of publication.

HOW TO USE THIS DOCUMENT

- This document is written in plain language for easy reading. Where there is a discrepancy between the Rules and information or a term in this document, the Rules take precedence.
- If you have questions about the business aspects of these changes, please see Consultations on AEMO's website.
- The references listed throughout this document are primary resources and take precedence over this document.
- Text in this format is a link to related information.
- **Text in this format**, indicates a reference to a document. Unless otherwise stated, you can find resources mentioned in this guide on AEMO's website.
- **Text in this format** is an action to perform in the MSATS Web Portal.
- Glossary Terms are capitalised and have the meanings listed against them in the **Guide to MSATS and B2B Terms** or Glossary.
- *Italicised terms* are defined in the Rules. Any rules terms not in this format still have the same meaning.

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Last update: Thursday, 21 November 2019~~Friday, 8 November 2019~~ 8:32 AM~~10:23 AM~~

VERSION HISTORY

~~1.01~~1.02 See Changes in this version

DOCUMENTS MADE OBSOLETE

The release of this document changes only the version of MSATS 46.96 Technical Specification - 5MS - Meter Data.

SUPPORT HUB

AEMO's Support Hub Phone: 1300 AEMO 00 (1300 236 600) and follow the prompts.

Contents

1. Introduction

The Five-Minute Settlement (5MS) project comes into effect 1 July 2021. It changes the trading interval for spot prices in the wholesale electricity market from every 30 minutes to every 5 minutes.

The 5-Minute Settlement - Meter Data (Project) is part of 5MS and includes changes related to participants' IT systems. This technical specification describes the functional changes planned by AEMO from a participant perspective.

1.1 Changes in this version

1. Removal of the proposed timeline until the dates are confirmed by the Readiness Working Group (RWG).
2. Additional Transition information on page 4.
3. Additional and changed B2M Meter Data information on page 4.
4. Updates in Reports on page 28~~on page 27~~.
5. Information about Unaccounted for Energy (UFE)~~Unaccounted for Energy (UFE)~~ on page 47~~on page 45~~.
6. User Rights Access for APIs on page 96~~on page 92~~.

AEMO releases new versions of this document as the technical requirements are streamlined.

1.2 Audience

AEMO provides this information as a service targeting business analysts and IT staff in participant organisations.

1. The primary audience is Meter Data Providers (MDPs) and API developers.
2. The secondary audience is Financial Responsible Market Participants (FRMPs) and Network Service Providers (DNSPs, TNSPs).

1.3 Objectives

The objectives of the 5MS Metering stream are:

1. Support settlement ready *metering data* received from the market.
2. Allow AEMO to receive and manage 5, 15, 30-minute and accumulation Meter Data Notifications in the MDFF meter reads format on the 1st of July 2021.
3. Allow AEMO to continue to receive and manage accumulation Meter Data Notifications in the MDMT meter reads format.
4. Allow AEMO to identify when *metering data* is missing and requires MDM Substitution.
5. Minimise the impact to participant's systems and processes by aligning the existing processes participants use to generate *metering data* and manage exceptions.
6. To support UFE calculation, allowing AEMO to reliably and accurately obtain settlement ready *metering data* at a register level.
7. Improve system and operational efficiencies across the market by unifying the data formats across the industry:
   a. The obligation on MDPs to maintain two separate interval data and exception management processes can result in inconsistencies in *metering data* versions.
   b. It reduces new entrant costs and lowers barriers to entry.

1.4 Rule, procedure, and process changes

Type	Detail
NER Rule	Chapter 7: 10.1, 10.3, 15.5
MDM Procedures	Changes under clause 7.16.2 of the NER
MDM File Format and Load Process	Documents the changes to the MDM file load process

1.5 Proposed timeline

The Readiness Working Group (RWG), will provide release dates when they confirm the dates. For details, see **5MS Readiness Working Group** on AEMO's website here.

1.6 Approval to change

There is no approval or agreement to change required from participant change controllers for this Release as it is part of the AEMC's Five-Minute Settlement rule change.

Amendments to the Rules regarding 5-minute settlements are published on the AEMC website: **National Electricity Amendment (Five-minute settlement rule) 2017** https://www.aemc.gov.au/rule-changes/five-minute-settlement.

2. Transition

AEMO will provide transition details when the details are confirmed by the Readiness Working Group (RWG). For details, see **5MS Readiness Working Group** on AEMO's website.

The transition challenge is moving from MDMF to MDFF and ensuring settlement ready interval *metering data* is obtained reliably and accurately. AEMO recognises the challenges MDPs may have aligning their *metering data* delivery processes for *interval metering data* reads.

To support MDP transition, AEMO introduces MDM functionality to identify settlement ready *metering data* using Data Streams defined in the CNDS and registers in the MDFF NEM12 200 record. This functionality is an interim solution only, as AEMO is reliant on the quality of the MDMDataStreamIdentifier, NMIConfiguration and the NMISuffix within the MDFF file itself to construct net data.

2.1 Metering data file format transition

This section explains how MDPs transition from supplying 30-minute *Settlements* meter data to supplying 5- and 15-minute *Settlements* meter data.

2.1.1 Prior to MDFF Acceptance go-live

Table 1 describes what *metering data* MDMT MeterDataNotifications for market settlements support and what Data Streams can be defined before MDFF Acceptance go-live.

Area	MDMT Transaction Type
5- minute Interval Readings	×
15-minute Interval Readings	×
30-minute Interval Readings	✓
Accumulation Readings	✓
CNDS Data Streams for Interval Metering	Net Suffix or register level Suffix AEMO Identifies settlement ready *metering data* using Data Streams defined in CNDS

Area	MDMT Transaction Type
CNDS Data Streams for Accumulation Metering	Suffix for Consumption Energy Data AEMO Identifies settlement ready *metering data* using Data Streams defined in CNDS

2.1.2 From MDFF Acceptance go-live

This table describes what *metering data* MDMT and MTRD MeterDataNotifications for market settlements support and what Data Streams can be defined from MDFF Acceptance go-live

Data Type	MDMT Transaction Type	MTRD Transaction Type
5- minute Interval Readings	✖	✓ AEMO aggregates 5- and 15-minute reads to 30 minutes to support 30-minute market settlements.
15-minute Interval Readings	✖	✓ AEMO aggregates 5- and 15-minute reads to 30 minutes to support 30-minute market settlements.
30-minute Interval Readings	✓	✓
Accumulation Readings	✓	✓
CNDS Data Streams for Interval Metering	Net Suffix or register level Suffix AEMO Identifies settlement ready metering data using Data Streams defined in CNDS	Net Suffix Initiators of MTRD must ensure that the MDFF NEM12 200 record MDMDataStreamIdentifier, NMIConfiguration and the NMISuffix is accurate. AEMO Identifies settlement ready metering data using Data Streams defined in CNDS and the MDFF NEM12 200 record MDMDataStreamIdentifier, NMIConfiguration, NMISuffix and registers to derive a net. OR Register Suffix AEMO Identifies settlement ready metering data using Data Streams defined in CNDS

Data Type	MDMT Transaction Type	MTRD Transaction Type
CNDS Data Streams for Accumulation Metering	Suffix for Consumption Energy Data AEMO Identifies settlement ready metering data using Data Streams defined in CNDS	Suffix for Consumption Energy Data AEMO Identifies settlement ready metering data using Data Streams defined in CNDS

2.1.3 From 1 July 2021

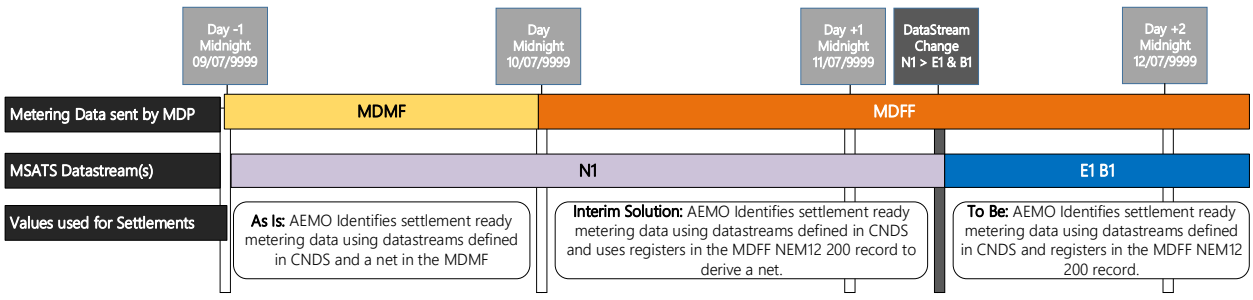
This table describes what *metering data* MDMT and MTRD Meter Data Notifications for market settlements support and what Data Streams can be defined from 1 July 2021.

Data Type	MDMT Transaction Type	MTRD Transaction Type
5- minute Interval Readings	×	✓
15-minute Interval Readings	×	✓ AEMO disaggregates received 15- and 30-minute reads to 5-minute resolution for market settlements
30-minute Interval Readings	× AEMO rejects 30-minute interval reads for settlement dates from the 1st of July 2021 onwards. AEMO accepts retrospective 30-minute interval reads for settlement dates prior to the 1st of July 2020	✓ AEMO disaggregates received 15- and 30-minute reads to 5-minute resolution for market settlements
Accumulation Readings	✓	✓

Data Type	MDMT Transaction Type	MTRD Transaction Type
CNDS Data Streams for Interval Metering	N/A	Net Suffix No new net suffixes Data Streams are to be defined For net suffix Data Streams defined prior to 1st July 2021 AEMO continues to identify settlement ready *metering data* using Data Streams defined in CNDS and NEM12 200 record MDMDataStreamIdentifier, NMIConfiguration, NMISuffix and registers in the MDFF to derive a net. OR Register Suffix AEMO Identifies settlement ready *metering data* using Data Streams defined in CNDS
CNDS Data Streams for Accumulation Metering	Suffix for Consumption Energy Data AEMO Identifies settlement ready *metering data* using Data Streams defined in CNDS	Suffix for Consumption Energy Data AEMO Identifies settlement ready *metering data* using Data Streams defined in CNDS

2.1.4 Calculation of net data stream from MDMDataStreamIdentifier

This diagram and table describe the MDM functionality to identify settlement ready *metering data* using Data Streams defined in the CNDS and registers in the MDFF NEM12 200 record.



Interim Solution	N1 is registered in the CNDS. MDFF file is sent to AEMO containing CSVIntervalData for Period1 with the following *metering data*: - A read with MDMDataStreamIdentifier = N1 and a NMISuffix = B1. - A second read with MDMDataStreamIdentifier = N1 and a NMISuffix = E1. - Two reactive load reads for K1 and Q1 where MDMDataStreamIdentifier is NULL. A sign is applied to the loaded register level reads based on the first character of the NMISuffix. - 'E1' for Period1 = (+) 10.000 - 'B1' for Period1 = (-) 2.000 A 5th N1 read is created. N1 is constructed from E1 and B1, reads that share the same NMI, IntervalDate and MDMDataStreamIdentifier: - 'E1' - 'B1' = 'N1'. - (+) 10.000 + (-) 2.000 = (+) 8.000 At settlements the CNDS registered Data Stream 'N1' is assessed. As 'N1' exists for Period1, 'N1' is read from the loaded meter data. (+) 8.000 is used as the settlement actual ((+) 10.000 + (-) 2.000 = (+) 8.000)
1 July 2021	E1 and B1 is registered in the CNDS. MDFF file is sent to AEMO containing CSVIntervalData for Period1 with the following reads: - A E1 read - A B1 read - Two reactive load reads for K1 and Q1 where MDMDataStreamIdentifier is NULL. The reads in the CSVIntervalData will be loaded as E1, B1, K1, Q1. A sign is applied to the loaded register level reads based on the first character of the NMISuffix. - 'E1' for Period1 = (+) 10.000 - 'B1' for Period1 = (-) 2.000 - At settlements the CNDS registered Data Stream 'E1' and 'B1' shall be assessed. (+) 8.000 is used as the settlement value ((+) 10.000 + (-) 2.000 = (+) 8.000)

2.2 How to transition for TUOS data

2.2.1 MDFF Acceptance go-live

1. Send MDFF data to NEMMCO (not VPXP). This is the same file MDPs are currently sending to B2B Participants.

2. ~~Update Victorian wholesale NMI Data Stream Suffix's that are part of VIC TUOS *metering data* delivery (example B, E, Q, K) to NMI Data Stream Type N.~~

2.2.2 VIC TUOS metering data with an active NMI data stream Suffix of Nx

MDPs ~~can~~ must follow these steps to transition ~~to comply with~~ VIC TUOS *metering data* ~~Delivery where the *NMI* has a *NMI* Data Stream Suffix of N~~for 5 minute settlements:

1. Set the NMI Data Stream Suffix Nx to inactive.

2. Stop sending MDMF files.

3. Set data stream types for NMI Data Stream suffix's types Ex and Bx to I.

4. Ensure all other Data Stream Suffix's (Cx, Fx, Kx, Lx, Qx, Rx) are set to NMI Data Stream Type N.

5. Change the metering resolution from 15-minute to 5-minute.

2.2.3 VIC TUOS metering data with NO active NMI data stream Suffix of N_x

MDPs must follow these steps to transition VIC TUOS *metering data* for 5 minute settlements:

1. Ensure all other Data Stream Suffix's (B_x, C_x, E_x, F_x, K_x, L_x, Q_x, R_x) are set to NMI Data Stream Type N.

2. Change the metering resolution from 15-minute to 5-minute.

3. B2M Meter Data

3.1 Meter data file format

The Meter Data File Format (MDFF) is extended to support 5- and 15-minute *metering data* along with the existing 30-minute. The use of MDFF changes from supporting Business to Business (B2B) Retail, Network and other Market Participant activities and Business to Market (B2M) Transmission Use of System (TUOS) Billing to also supporting B2M *Market Settlements*.

For more details, see Meter Data File Format Specification NEM 12 and NEM 13 v2.0 Consultation.

AEMO identifies settlement ready *metering data* using Data Streams defined in CATS NMI Data Stream (CNDS).

3.1.1 MDFF changes

The MDFF specification has the following changes:

1. The NEM12 format is used for interval *metering data*.
   The Record 200 (IntervalLength) field is used to specify the interval length for NEM12.
2. The NEM13 format is used for accumulation *metering data*.

MDPs use the B2B aseXML schema when using MDFF. For more details and examples, see MDM File Format and Load Process.

3.2 MTRD meter data notification

The MTRD Meter Data Notification transaction supports the following three notifications:

1. B2M MTRD: B2M *Market Settlements*.
2. B2B MTRD: B2B Retail, Network and other Market Participant activities.
3. B2M Transmission Use of System (TUOS) Billing for Victoria only.

There are no changes to the aseXML message format for B2B MTRD Meter Data Notification or B2M MDMT Meter Data Notification transactions. For details, see B2B Mapping to aseXML (section 2.2).

3.2.1 Identifying MTRD notifications

Market Settlements

Participants can identify an MTRD Meter Data Notification is for B2M *market settlements* by nominating:

1. NEMMCO as the To Party Identifier in the aseXML Header record. For details, see **B2B Mapping to aseXML** (section 2.2).

2. NEMMCO as the Participant ID of the intended *Registered Participant* in the MDFF Header record (100) ToParticipant. For help, see **MDFF Specification NEM12 and NEM13** (section 4.2, v20).

For B2M *market settlements:*

- The message patterns between the Initiating Participant and AEMO, where AEMO acts as the Recipient, mirror the process described in the **B2B Procedure Technical Delivery Specification** (section 6.4).
- AEMO sends the hub acknowledgment to the Initiator.
- The from party identifier of a Hub Acknowledgement is NEMMCO.
- AEMO acts as a B2B Recipient, validating the MTRD messages and generating an **ase:MessageAcknowledgement** according to the **B2B Procedure Technical Delivery Specification** (section 2).
- AEMO acts as a B2B Recipient, validating the MTRD messages and generating an **ase:TransactionAcknowledgement** according to the **B2B Procedure Technical Delivery Specification** (section 2).

TUOS Meter Data Delivery

Participants can identify an MTRD Meter Data Notification is for B2M TUOS Meter Data Delivery by nominating:

1. NEMMCO (currently VPXP) as the To Party Identifier in the aseXML Header record. For details, see **B2B Mapping to aseXML** (section 2.2).

2. NEMMCO (currently VPXP) as the Participant ID of the intended *Registered Participant* in the MDFF Header record (100) ToParticipant. For help, see **MDFF Specification NEM12 and NEM13** (section 4.2, v20).

For B2M TUOS Meter Data Delivery:

- The message patterns between the Initiating Participant and AEMO, where AEMO acts as the Recipient, mirror the process described in the **B2B Procedure Technical Delivery Specification** (section 6.4).

- AEMO sends the hub acknowledgment to the Initiator.
- The from party identifier is NEMMCO.
- AEMO acts as a B2B Recipient, validating the MTRD messages and generating an **ase:MessageAcknowledgement** according to the **B2B Procedure Technical Delivery Specification** (section 2).
- AEMO acts as a B2B Recipient, validating the MTRD messages and generating an **ase:TransactionAcknowledgement** according to the **B2B Procedure Technical Delivery Specification** (section 2).

Retail and Networking activities

Participants can identify an MTRD Meter Data Notification is for B2B Retail, Network, and other *Market Participant* activities by nominating:

1. A valid Participant ID other than NEMMCO as the To Party Identifier in the aseXML Header record. For details, see **B2B Mapping to aseXML** (section 2.2).

2. A valid Participant ID other than NEMMCO of the intended *Registered Participant* in the MDFF Header record (100) ToParticipant. For help, see **MDFF Specification NEM12 and NEM13** (section 4.2, v20).

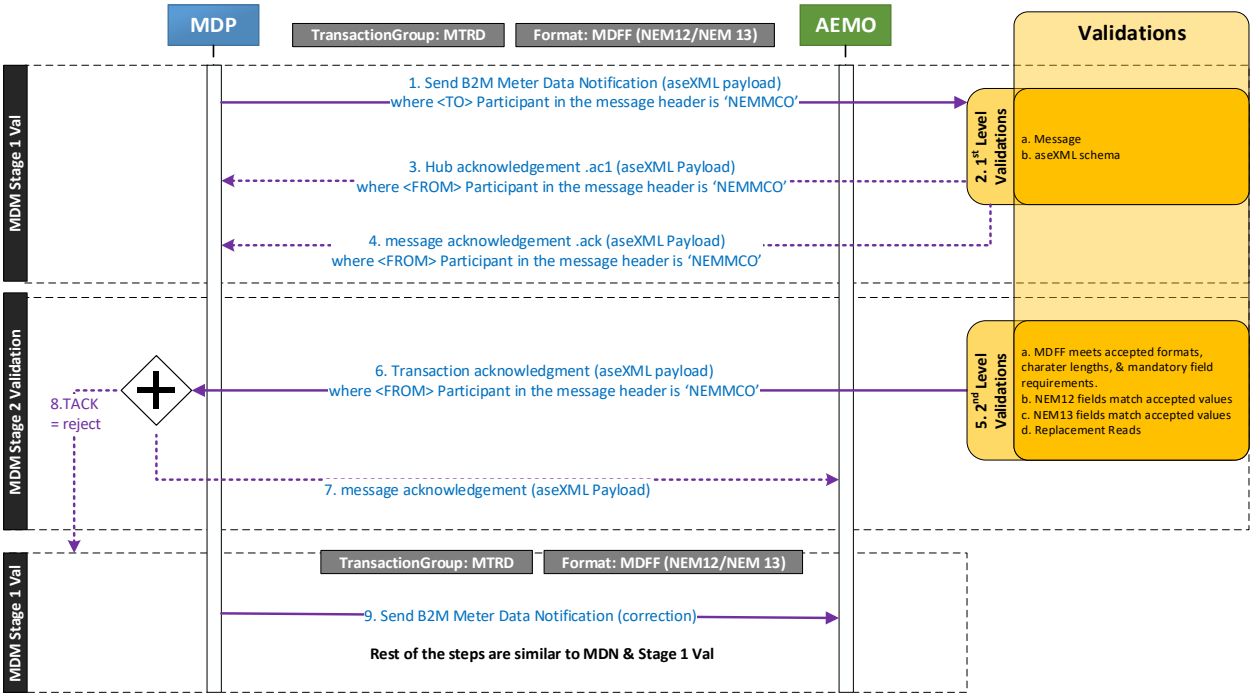
For B2B Retail, Network, and other *Market Participant* activities*:*

- The message patterns between the Participants is described in the **B2B Procedure Technical Delivery Specification** (section 6.4).

3.2.2 B2M MTRD exchange

The MTRD message exchange for B2M Market Settlements and TUOS Meter Data Delivery aligns with B2B Retail and Network processes where participants send messages to AEMO using the NEMMCO Participant ID, although AEMO is not a *B2B Participant*.

Figure 1 MTRD message exchange between MDPs and AEMO



3.2.3 B2M MTRD exchange steps

Step	Initiator	Example	Recipient	Details
1.	MDP	Submit B2M MTRD Meter Data Notification with *metering data* for B2M Market.	AEMO	The TO participant in the message header is NEMMCO. The MDFF Header record (100) ToParticipant is NEMMCO. For details, see MDFF Specification NEM12 and NEM13 (section 4.2, v20). The B2B Synch API is not available for B2M MTRD Meter Data Notification submissions and is errored out if attempted.

Step	Initiator	Example	Recipient	Details
2.	AEMO	Performs level 1 validations of the message and transaction(s).	AEMO	The following validations are executed: - Message - aseXML Schema
3.	AEMO	Sends a Hub Acknowledgement.	MDP	Hub Acknowledgement: - FTP protocol = .ac1. - Webservice Protocol: ack payload.
4.	AEMO	Sends a Message Acknowledgement.	MDP	The **FROM** participant in the header of the Message Acknowledgement is NEMMCO. Message Acknowledgement: - FTP protocol - .ack. - Web service Protocol – ack payload.
5.	AEMO	Performs level 2 validations.	AEMO	The following validations are executed: - The MDFF meets accepted formats, character lengths, & mandatory field requirements. - The NEM12 & NEM13 fields match accepted values. - Replacement Reads. Due to delays updating MSATS, AEMO does not reject MTRD Transactions where the MSATS Standing Data and the information provided in the MDFF file do not align at the time of receipt.

Step	Initiator	Example	Recipient	Details
6.	AEMO	Sends Transaction Acknowledgement containing the results of level 2 validations.	MDP	The **FROM** participant in the header of the Transaction Acknowledgement is NEMMCO. Where the Transaction Acknowledgement is **Reject**, the MDP must resend the correct version of the entire transaction (and all its reads). Where the Transaction Acknowledgement is **Partial**, the MDP must resend only the corrected version of the rejected reads. Where the MDFF format fails structural validations, so the MDP isn't required to send Acknowledgements, the Message and Transaction Acknowledgement(s) are bundled as a single Message Acknowledgement file or payload.
7.	MDP	The Initiating MDP validates ase:TransactionAcknowledgements and sends an ase:MessageAcknowledgements to AEMO.	AEMO	
8. – 9.	MDP	Where the ase:TransactionAcknowledgements generated by AEMO is a reject or partial, the MDP creates a new MTRD Meter Data Notification containing corrected *metering data* for the rejected reads only.		Corrected *metering data* must include all NMI suffixes associated with a NMI for any IntervalDate in the same transaction.

3.2.4 Submit and receive B2M MTRD transaction type

Participants can use the following options to submit and receive B2M MTRD Meter Data Notifications:

1. A B2BMessagingAsync (Push-Push) API. For details, see **B2B SMP Technical Guide**.

2. A B2BMessagingPull (Push-Pull) API. For details, see **B2B SMP Technical Guide**.

3. The FTP Gateway and their Participant File Server Participant Directory Inbox. For details, see Using the file interface in **Introduction to MSATS**.

4. The MSATS Web Portal > **B2B Browser** > **Upload File** menu. For help, see **Guide to MSATS B2B**.

You cannot use the B2BMessagingSync API to submit a B2M MTRD Meter Data Notification for Market Settlements or TUOS Meter Data Delivery.

3.3 MDMT meter data notification

3.3.1 Identifying MDMT meter data

Market settlements

Participants can identify a B2M MDMT Meter Data Notifications is for *market settlements* by nominating NEMMCO as the To Party Identifier in the aseXML Header record. For help, see **MDM File Format and Upload Process**.

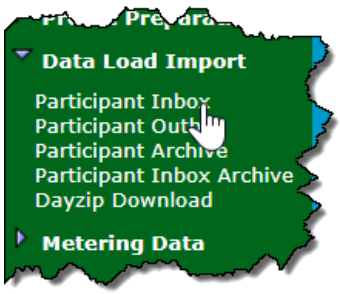
3.3.2 Submit MDMT transaction type

Participants can use the following options to submit and MDMT Meter Data Notifications:

1. A B2MMessagingAsync (Push-Push) API. For details, see B2MMessagingAsync on page 65~~on page 62~~.

2. The FTP Gateway and their Participant File Server Participant Inbox. For details, see Using the file interface in **Introduction to MSATS**.

3. The MSATS Web Portal > **Data Load Import** > **Participant Inbox** > **Upload**. For help, see **Guide to MSATS Web Portal**.



3.3.3 Identifying missing and mismatched reads

RM11 report

MDPs receive scheduled RM11 reports:

- To identify missing reads.
- To identify where reads are not available for active NMI Data Stream Suffixes.

Missing reads are identified and pushed to MDP's prior to each settlement run.

For examples, see MDM Missing and Mismatched Reads Report Scenarios~~MDM Missing and Mismatched Reads Report Scenarios~~ on page 110~~on page 100~~

New logic is included to cater for missing reads where the *metering data* is received as MTRD NEM12 csv interval data and the CNDS Data Stream is defined as a net (Nx) Data Stream.

Where the CNDS Data Stream is defined as a net (for example, N1), if AEMO receives no reads it can use to construct the net read using the MDMDataStreamIdentifier for the settlement date, it identifies N1 as a missing read.

RM37 report

MDPs receive a new scheduled RM37 report:

- With Missing High Priority reads.
- Identifying where reads are not available for active NMI Data Stream suffixes for high priority NMIs (TNI's generators, TNSP connected loads, interconnectors and so on).

Missing reads are identified and pushed to MDPs daily.

RM38 report

MDPs receive a new scheduled RM38 report:

- With missing Data Streams.
- Identifies where an active NMI Data Stream Suffix of 'N' (net) and not all contributory suffixes are received. (for example, E or B reads missing).

RM39 report

MDPs receive a new scheduled RM39 report:

- For mismatched reads.
- Identifying where an MDFF file is received with settlement type suffixes (for example, Ex, Bx, or Nx) where there is no active CNDS Data Stream suffix.

Where the Data Stream suffix is Ex or Bx, check the MDMDataStreamIdentifier for a match.

Mismatched reads are identified and pushed to MDPs prior to each settlement run.

~~FRMP~~ Requesting reports with custom report parameters~~reports~~

- To receive RM11, RM37, and RM38 reports with participant specified report parameters, MDPs and FRMPs can submit a report request using their MSATS Participant Inbox.

3.4 File validation

For details about file validations for:

- B2M MTRD CSV Interval Data submissions, see **MDM File Format and Load Process v2.0** (section 5.2.4).
- B2M MTRD CSV Consumption Data submissions see **MDM File Format and Load Process v2.0** (section 5.2.5).
- MDMT CSV Consumption Data submissions see **MDM File Format and Load Process v2.0** (section 5.1.3).

3.5 Error codes

For details about common *metering data* upload errors, see **Hints and Tips – CATS & NMI Discovery**.

3.6 MDP meter data impact

3.6.1 IT systems

MDPs must make changes in their systems to:

1. Send interval metering data at 5-, 15-minute, and the existing 30-minute resolution.

For transition details, see Transition~~Transition~~ on page 4.

Format

2. From the MDFF Accepted Go-Live, commence the transition to sending interval *metering data* to AEMO for market settlements in the MDFF format.
3. From the 1st of July 2021, cease sending interval *metering data* to AEMO for market settlements in the MDMF format. AEMO continues to accept accumulation *metering data* in the MDMF NEM13 format.

4. Optionally, commence sending accumulation *metering data* to AEMO for market settlements in the MDFF NEM13 format.

5. Add NEMMCO as a recipient in the To Participant ID MTRD MeterDataNotifications messages with *metering data* intended for market settlements.

6. Add NEMMCO under the To Participant ID within the MDFF Header record (100) of MTRD MeterDataNotifications messages with *metering data* intended for market settlements.

7. Process the returned transaction acknowledgment from NEMMCO for interval and accumulation *metering data* sent via MDFF.

8. Handle additional MDFF and market settlements specific validations returned in the transaction acknowledgment.

9. Accept automated reports. For details, see Reports on page 28~~on page 27~~.

10. To validate processing with AEMO and other parties, we recommend participants take part in industry testing using AEMO's 5MS Staging and pre-production systems.

3.6.2 NMI standing data

1. When an MDP end dates the net Nx Data Stream and populates the Ex and Bx streams, they can move from defining Nx to Ex and Bx in the NEM12 MDMDatastreamidentifier field.

2. MDPs can migrate CATS NMI Data Stream (CNDS) data whenever they have switched to the MDFF file format.

3. It is possible MDPs may need to support MDFF for some NMIs, and MDMF for others.

3.6.3 Metering data uploading

1. MDPs deliver the same MTRD Meter Data Notification *metering data* they send to FRMPs, DNSPs, MDPs or MCs to **NEMMCO** as if AEMO is a *B2B Participant*. However, AEMO is not a *B2B Participant* so is not governed by the B2B Procedures.

2. AEMO does not send Verify Meter Data (VMD) or Provide Meter Data (PMD) transactions in response to a **NEMMCO** directed MTRD Meter Data Notification.

3. Where *metering data* has changed, the MDP must send a correcting MTRD Meter Data Notification to the **NEMMCO** participant according to the existing **NER Chapter 7** obligations and **MSATS procedures**, including the **Metrology Procedure: Part A and Part B**, and the **Service Level Procedures: Metering Provider Services**.

4. MDPs continue to use the B2B aseXML schema when they send MTRD Meter Data Notification transactions.

5. To cater for off-market Data Streams, meter churn, and new installations where a meter is reconfigured and MDPs send *metering data* before the meter's standing data is established. In each scenario an informational warning is generated and sent to the participant in the Transaction Acknowledgment. the following MDMF validation is relaxed for MDFF:

    a. *Metering data* for Data Streams and meter registers not in CNDS can load.

    b. NMIs not established in CATS NMI Data (CND) can load.

    c. *Metering data* sent by a participant not in the CATS NMI Participants Relationships (CNPR) role can load.

6. Additional MDFF NEM12 interval data validations are:

    a. To apply the UOM factor, the UOM for a target must be known.

    b. To determine the sign, the first character of the NMISuffix (E from E1, B from B1) must be known.

7. AEMO loads all *validated metering* data but does not use them for energy allocation unless the Data Stream:

    a. Is defined for use for settlements in CNDS.

    b. Is type I (interval) or C (accumulation).

    c. Type P is not used for energy allocation but may be used to construct profiles.

8. MSATS Web Portal: There are changes to the MSATS Web Portal, allowing participants to upload and submit MTRD Meter Data Notification transactions to the NEMMCO Participant User ID.

3.7 B2B browser > upload file

- For *market settlements* and TUOS *metering data* delivery, participants submit B2M MTRD Meter Data Notifications in the **B2B Browser** > **Upload File** menu.
- The message acknowledgment status and filename display on the **Upload File** interface.

3.8 B2B hub queue

Participants choosing to receive B2B communications using APIs can:

- View, search, sort, acknowledge, and reject B2B messages and transactions queued in their B2B Hub Queue. Where AEMO cannot deliver messages to a participant's API gateway or the participant chose message delivery using the API Push-Pull outbox protocol, B2B communications are queued.
- ~~Delete acknowledgements in the their B2B Hub Queue.~~
- Participants can manage B2B and B2M MTRD messages in the B2B Hub Queue interface.

3.9 FTP system status

In **Participants > FTP System Status**, the interface changes so participants can see the Hub **System** status of B2M APIs. See Figure 2 below and Figure 3 below.

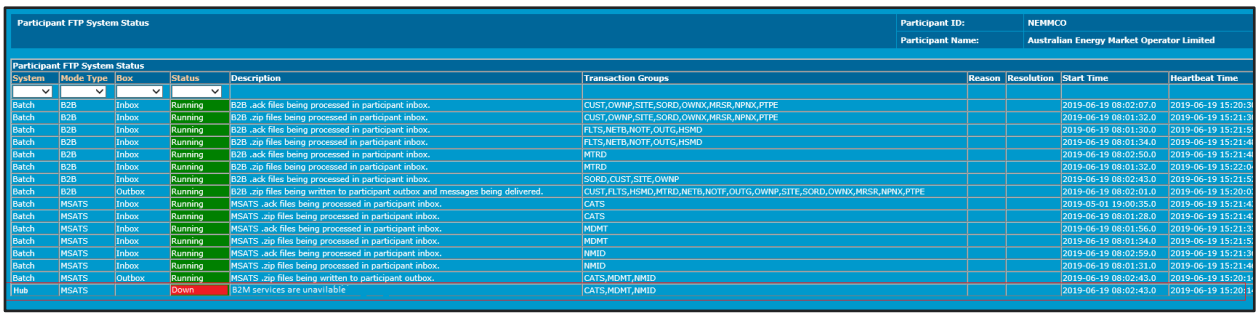
Participants can view Stop File status in Queue Monitoring > Change Request Queue.

The available Hub statuses are: Running or Down.

Figure 2 - B2M API status

System	Mode Type	Box	Status	Description	Transaction Groups	Reason	Resolution	Start Time	Heartbeat Time
Hub	MSATS	null	Running	All B2M services are available.	CATS/NMID/MDMT	null	null	null	null
Hub	MSATS	null	Down	All B2M services are available.	CATS/NMID/MDMT	null	No resolution. Please wait for B2M services to start.	null	null

Figure 3 FTP system status example



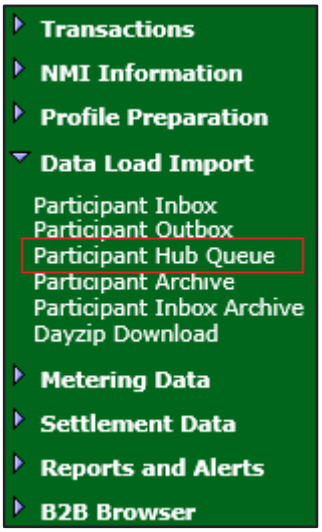
Participant FTP System Status

Participant ID: NEMMCO
Participant Name: Australian Energy Market Operator Limited

Participant FTP System Status

System	Mode Type	Box	Status	Description	Transaction Groups	Reason	Resolution	Start Time	Heartbeat Time
Batch	B2B	Inbox	Running	B2B .ack files being processed in participant inbox.	CUST,OWNP,SITE,SORD,OWNX,MRSR,NPNX,PTPE			2019-06-19 08:02:07.0	2019-06-19 15:20:3
Batch	B2B	Inbox	Running	B2B .zip files being processed in participant inbox.	CUST,OWNP,SITE,SORD,OWNX,MRSR,NPNX,PTPE			2019-06-19 08:01:32.0	2019-06-19 15:21:3
Batch	B2B	Inbox	Running	B2B .ack files being processed in participant inbox.	FLTS,NETB,NOTF,OUTG,HSMD			2019-06-19 08:01:30.0	2019-06-19 15:21:5
Batch	B2B	Inbox	Running	B2B .zip files being processed in participant inbox.	FLTS,NETB,NOTF,OUTG,HSMD			2019-06-19 08:01:34.0	2019-06-19 15:21:4
Batch	B2B	Inbox	Running	B2B .ack files being processed in participant inbox.	MTRD			2019-06-19 08:02:50.0	2019-06-19 15:21:4
Batch	B2B	Inbox	Running	B2B .zip files being processed in participant inbox.	MTRD			2019-06-19 08:01:32.0	2019-06-19 15:22:0
Batch	B2B	Inbox	Running	B2B .ack files being processed in participant inbox.	SORD,CUST,SITE,OWNP			2019-06-19 08:02:43.0	2019-06-19 15:21:5
Batch	B2B	Outbox	Running	B2B .zip files being written to participant outbox and messages being delivered.	CUST,FLTS,HSMD,MTRD,NETB,NOTF,OUTG,OWNP,SITE,SORD,OWNX,MRSR,NPNX,PTPE			2019-06-19 08:02:01.0	2019-06-19 15:20:0
Batch	MSATS	Inbox	Running	MSATS .ack files being processed in participant inbox.	CATS			2019-05-01 19:00:35.0	2019-06-19 15:21:4
Batch	MSATS	Inbox	Running	MSATS .zip files being processed in participant inbox.	CATS			2019-06-19 08:01:28.0	2019-06-19 15:21:4
Batch	MSATS	Inbox	Running	MSATS .ack files being processed in participant inbox.	MDMT			2019-06-19 08:01:56.0	2019-06-19 15:21:3
Batch	MSATS	Inbox	Running	MSATS .zip files being processed in participant inbox.	MDMT			2019-06-19 08:01:34.0	2019-06-19 15:21:5
Batch	MSATS	Inbox	Running	MSATS .ack files being processed in participant inbox.	NMID			2019-06-19 08:02:59.0	2019-06-19 15:21:3
Batch	MSATS	Inbox	Running	MSATS .zip files being processed in participant inbox.	NMID			2019-06-19 08:01:31.0	2019-06-19 15:21:4
Batch	MSATS	Outbox	Running	MSATS .zip files being written to participant outbox.	CATS,MDMT,NMID			2019-06-19 08:02:43.0	2019-06-19 15:20:1
Hub	MSATS		Down	B2M services are unavailable	CATS,MDMT,NMID			2019-06-19 08:02:43.0	2019-06-19 15:20:1

3.10 Participant hub queue



In the **Data Load Import > Participant Hub Queue,** participants who opted for API PULL as their delivery protocol can:

- View all messages ready for pulling.
- View, sort, download, acknowledge, accept, and reject B2M messages and acknowledgements from the e-Hub queue.
- View the total number of messages queued.
- View a total of 100 unacknowledged records where the Transaction Protocol is API.
- See the message's age using the create date.
- See the latest 100 messages.
- Manage MDMT messages in the Participant Hub Queue interface.
- To access the Participant Hub Queue, select **Data Load Import > Participant Hub Queue**.

File Name	MessageID	Message Type	Transaction Group	Priority	Date Created	Action
catsl_nemmcobatch_706568996.zip	939084340846-SOMW-4	Transaction Message	CATS	Low	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
catsl_nemmcobatch_706569341.zip	939084340846-SOMW-4	Transaction Message	CATS	Low	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
catsl_nemmcobatch_706569686.zip	939084340846-SOMW-4	Transaction Message	CATS	Low	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
catsl_nemmcobatch_706570031.zip	939084340846-SOMW-4	Transaction Message	CATS	Low	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_nemmco_satheesh_1.ack	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Mar 19 15:37:55 AEDT 2019	Download
mdmtm_vpxpbatch_706570345.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_vpxpbatch_706570346.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_vpxpbatch_706570347.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_vpxpbatch_706570348.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_vpxpbatch_706570349.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject
mdmtm_vpxpbatch_706570350.zip	939084340846-SOMW-4	Transaction Message	MDMT	Medium	Tue Feb 12 10:58:35 AEDT 2019	Download Accept Reject

3.11 Participant aseXML schema

The existing **Participants** > **Participant Schema** changes to support the following schema and delivery protocol changes to B2M Transaction Groups:

- View or change your current B2M aseXML schema version: Current, Superseded, or Latest.
- Set different Participant Outbox protocols for different CATS, NMID, or MDMT Transaction Groups: FTP, API-Pull, API-Push.
- View your outstanding **Messages** and **ACKS**.
- Change an **aseXML schema version** or **Protocol**. See Figure 4 below.

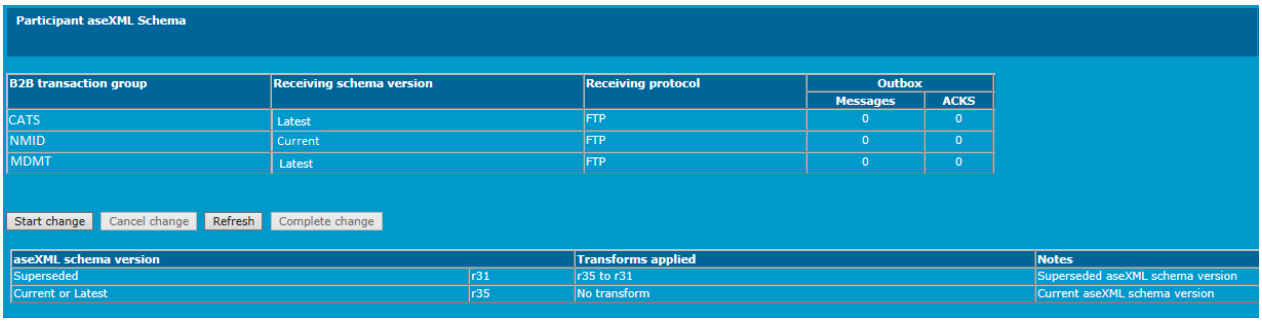
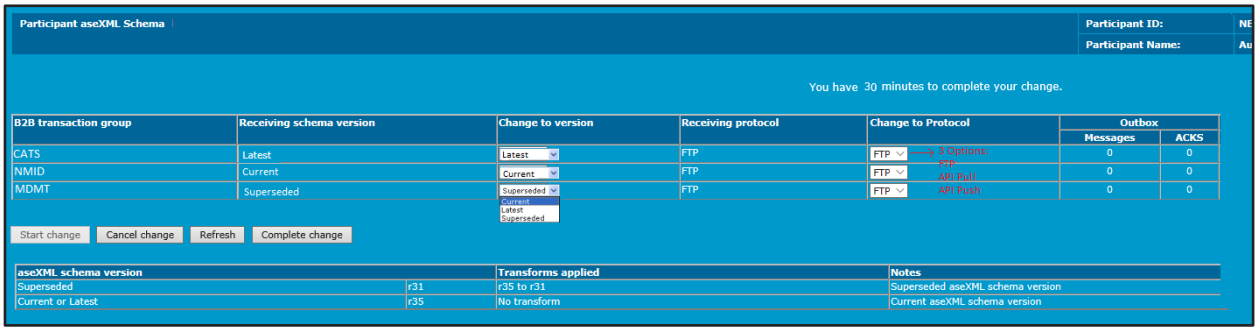


Figure 4 Schema or protocol change



3.12 MDM reports

Participants can access new MDM reports from the **Reports and Alerts** > **MDM** menu. For report details, see New MDM reports on page 35~~on page 34~~.

3.13 Metering data

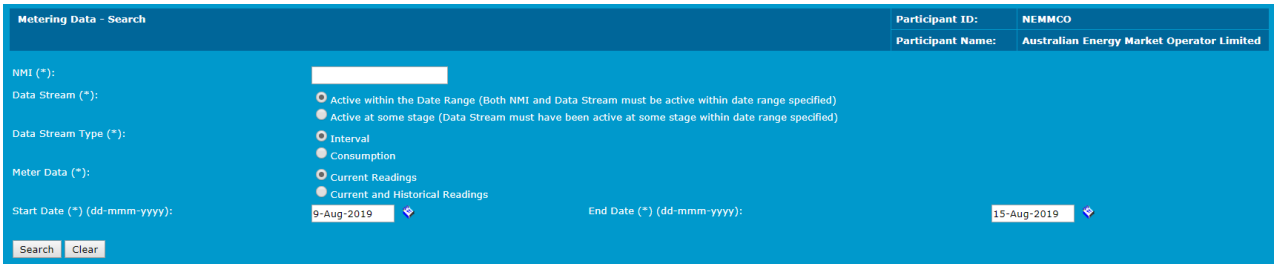
Participants can retrieve *metering data* received from MDPs from the **Metering Data – Data Search** interface. Interval *metering data* is provided in the same interval length sent by MDPs. The existing pages are modified to:

- Allow *registered participants* to query, at maximum, 7 days of interval *metering data*.

- Allow *registered participants* to query, at maximum, 12 months of consumption *metering data*.
- Display *metering data* in the resolution that it was delivered (5-, 15-, 30-minute)
- Support an export to csv function for query results.
- Restructure displayed query results to support readability and consistency across the Interval and Consumption *metering data* results interfaces.
- Display *metering data* for any suffixes defined in the CNDS table, such as net data (Nx) streams, active (Ex, Bx) or reactive (Kx, Qx) suffixes.
- Display *metering data* sent to AEMO regardless of the format (MDMF or MDFF) from the initiating participant.

3.13.1 Metering Data – Search

Modelled on the existing **Metering Data - Search** interface used to set query parameters and execute a metering data search.

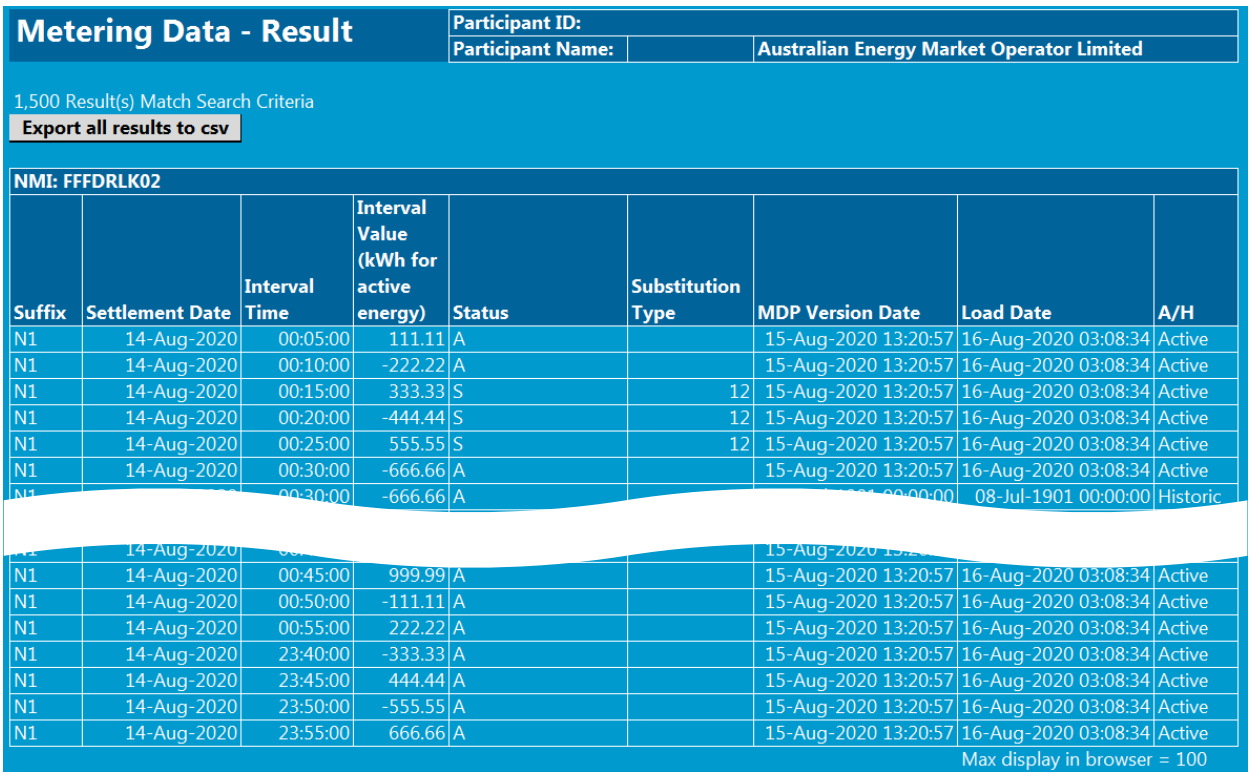


3.13.2 Metering Data – Results (interval)

This interface displays the returned Metering Data – Search query results. This interface is redesigned to accommodate:

- The different time resolutions: 5-, 15-, and 30-minutes of participants submitted *metering data*.
- An **Interval Time** results column.
- A **Substitution type** column (where applicable).
- A row per interval per suffix.
- An **Interval Value** and **Status** per row.
- An export to csv function.

Figure 5 Metering Data – Results (interval) originating MTRD/MDMT



Metering Data - Result

Participant ID:
Participant Name: Australian Energy Market Operator Limited

1,500 Result(s) Match Search Criteria

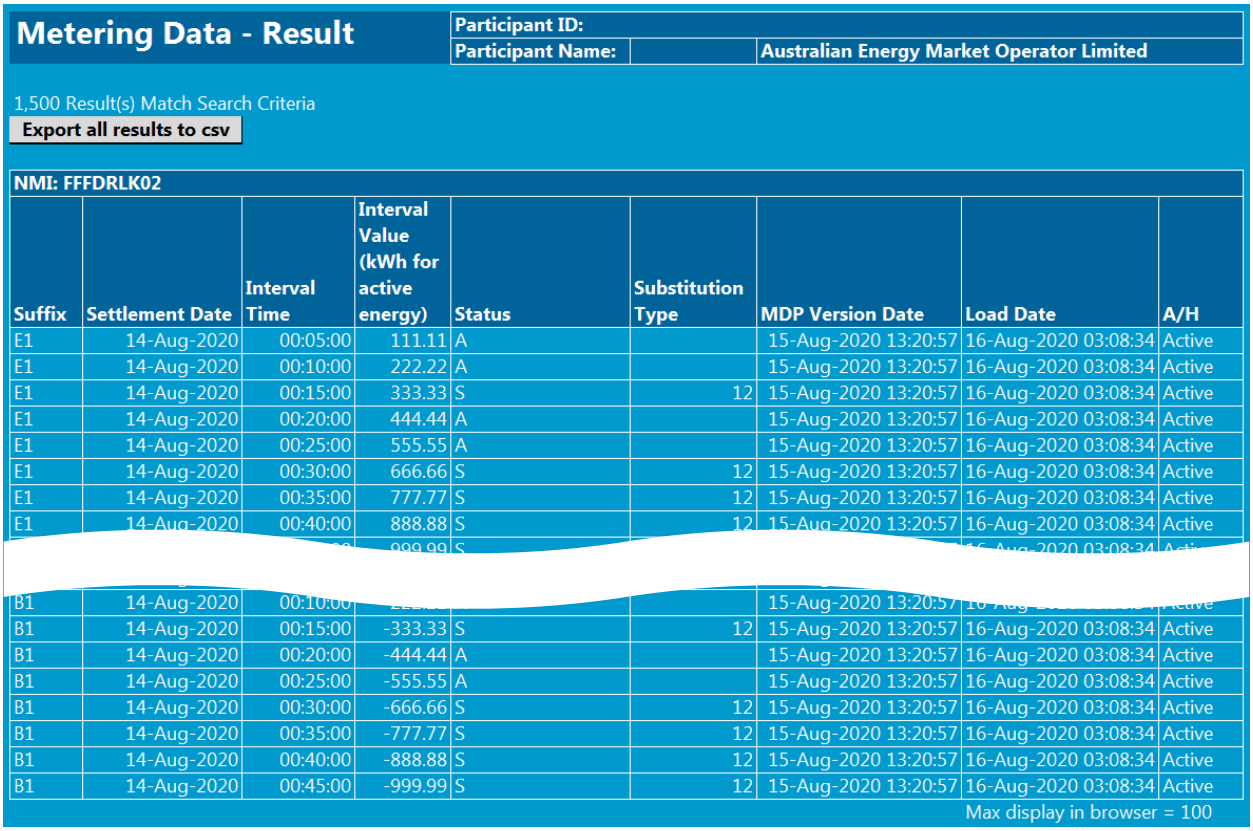
Export all results to csv

NMI: FFFDRLK02

Suffix	Settlement Date	Interval Time	Interval Value (kWh for active energy)	Status	Substitution Type	MDP Version Date	Load Date	A/H
N1	14-Aug-2020	00:05:00	111.11	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:10:00	-222.22	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:15:00	333.33	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:20:00	-444.44	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:25:00	555.55	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:30:00	-666.66	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:30:00	-666.66	A			08-Jul-1901 00:00:00	Historic
N1	14-Aug-2020	00:45:00	999.99	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:50:00	-111.11	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	00:55:00	222.22	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	23:40:00	-333.33	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	23:45:00	444.44	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	23:50:00	-555.55	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
N1	14-Aug-2020	23:55:00	666.66	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active

Max display in browser = 100

Figure 6 Metering Data – Results (interval) originating MTRD



Metering Data - Result

Participant ID:
Participant Name: Australian Energy Market Operator Limited

1,500 Result(s) Match Search Criteria

Export all results to csv

NMI: FFFDRLK02

Suffix	Settlement Date	Interval Time	Interval Value (kWh for active energy)	Status	Substitution Type	MDP Version Date	Load Date	A/H
E1	14-Aug-2020	00:05:00	111.11	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:10:00	222.22	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:15:00	333.33	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:20:00	444.44	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:25:00	555.55	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:30:00	666.66	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:35:00	777.77	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
E1	14-Aug-2020	00:40:00	888.88	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:15:00	-333.33	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:20:00	-444.44	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:25:00	-555.55	A		15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:30:00	-666.66	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:35:00	-777.77	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:40:00	-888.88	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active
B1	14-Aug-2020	00:45:00	-999.99	S	12	15-Aug-2020 13:20:57	16-Aug-2020 03:08:34	Active

Max display in browser = 100

3.13.3 Metering Data – Results (consumption)

This interface displays the returned **Metering Data – Search** query results. This interface is redesigned to accommodate:

- A reordering of results columns to match the redesigned **Metering Data – Results (interval)** interface.
- An export to csv function.

Figure 7 Metering Data – Results (consumption) originating MTRD/MDMT

Metering Data - Result

Participant ID:		NEMMCO
Participant Name:		Australian Energy Market Operator Limited

1,500 Result(s) Match Search Criteria

Export all results to csv

NMI: FFFDRLK02

Suffix	From Date	To Date	Value (kWh)	Status	Substitution Type	MDP Version Date	Load Date	A/H
11	14-Aug-2020	26-Aug-2020	111.11	A		16-Aug-2020 09:36:00	28-Aug-2020 09:36:00	Active
11	10-Sep-2020	22-Sep-2020	222.22	A		12-Sep-2020 12:00:00	24-Sep-2020 12:00:00	Active
11	07-Oct-2020	19-Oct-2020	333.33	A		09-Oct-2020 14:24:00	21-Oct-2020 14:24:00	Active
11	03-Nov-2020	15-Nov-2020	444.44	S	12	05-Nov-2020 16:48:00	17-Nov-2020 16:48:00	Active
22	30-Nov-2020	12-Dec-2020	555.55	S	12	02-Dec-2020 19:12:00	14-Dec-2020 19:12:00	Active
22	27-Dec-2020	08-Jan-2021	666.66	A		29-Dec-2020 21:36:00	10-Jan-2021 21:36:00	Active
22	[illegible]	04-Feb-2021	777.77	A		[illegible]	06-Feb-2021 02:24:00	Active
[illegible]								
11	14-Apr-2021	26-Apr-2021	111.11	A		16-Apr-2021 03:21:36	28-Apr-2021 03:21:36	Active
11	11-May-2021	23-May-2021	222.22	A		13-May-2021 09:36:00	25-May-2021 09:36:00	Active
11	07-Jun-2021	19-Jun-2021	333.33	A		09-Jun-2021 03:36:00	21-Jun-2021 03:36:00	Active
22	04-Jul-2021	16-Jul-2021	444.44	A		06-Jul-2021 03:50:24	18-Jul-2021 03:50:24	Active
22	31-Jul-2021	12-Aug-2021	555.55	A		02-Aug-2021 04:04:48	14-Aug-2021 04:04:48	Active
22	27-Aug-2021	08-Sep-2021	666.66	S	12	29-Aug-2021 03:50:24	10-Sep-2021 03:50:24	Active

Max display in browser = 100

3.14 Queue monitoring

In the existing **Reports and Alerts > Queue Monitoring** interface participants manage their message flow control for messages submitted by B2M APIs or to their B2M Inbox in the Participant File Server:

3.14.1 Change Request Queue

View the daily estimate of CATS Change Requests and see if any Change Request Stop Files exist against your Participant ID.

3.14.2 Outbound Notifications Queue

View the daily estimate of CATS Change Request Notifications and see if you have any Change Request Notification Stop Files.

3.14.3 Next Schedule Read Date Change Request Queue

View the daily count of CATS Change Requests with the Change Reason Code 5071 and see if you have any NSRD Notification Stop Files.

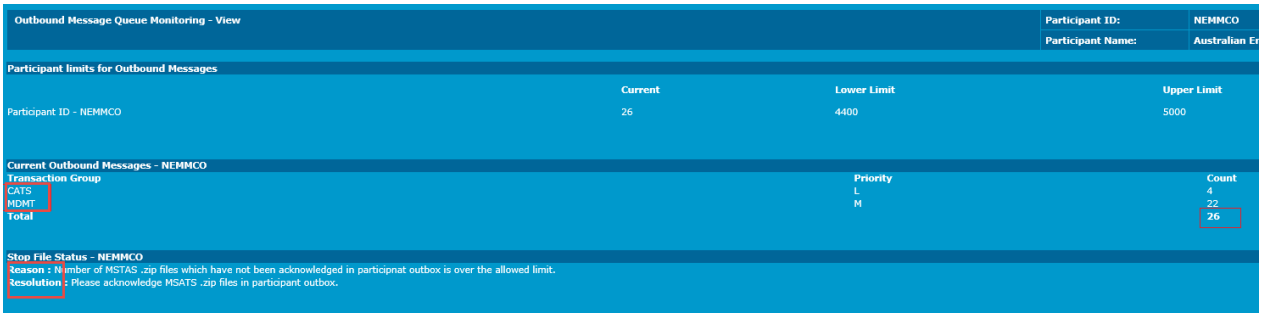
3.14.4 Report Scheduler Queue

View the daily count of unprocessed reports and see if you have any Report Stop Files.

3.14.5 Outbound Message Queue

View the current daily count of unacknowledged Participant Hub Queue and Participant File Share Outbox messages and see if you have any Outbound Stop Files.

The interface changes to inform participants if they have exceeded the limit of particular queue and are stopped. If the batch handler is stopped, the Reason why and the Resolution display.



3.15 Settlement data

In the Settlement Data menu, the **Uncommitted Data Cases** and **Committed Data Cases** menus are no longer available.

3.16 Participant impact for the MSATS Web Portal

- For access to the new web portal functions, PAs need to provide Participant Users with access rights. For help, see User Rights Access on page 96~~on page 92~~.

4. Reports

4.1 Report availability

Many reports are restricted to participant role types, for example: MDP, LNSP, FRMP, and so on.

4.2 Report requests

Participants obtain reports using the following methods:

1. An MDMT Report Request transaction (initiated by participants) from the **MSATS Web Portal > Reports and Alerts > MDM menu**. The report request:
   - Is for immediate compilation and delivery.
   - Is scheduled to run as a one-off for a choice of reports with an option to specify a run date and time.
2. Using FTP to the Participant File Server, participants can place MDMT report messages directly into their Participant Directory Inbox. The report request can be:
   - For immediate compilation and delivery.
   - Scheduled to run as a one-off for a choice of reports using the <RunDate> yyyy-mm-ddThh:mm:ss.sss+10:00 parameters.
3. Using an API to AEMO's e-Hub. Participants can place MDMT report messages using the AEMO B2M e-Hub Asynchronous Push-Push or Push-Pull APIs. The report request can be:
   - For Immediate compilation and delivery.
   - Scheduled to run as a one-off for a choice of reports using the <RunDate> yyyy-mm-ddThh:mm:ss.sss+10:00 parameters.
4. An AEMO system generated report created by AEMO and sent to participants. These are triggered by:
   - The schedule calendar, for example weekly or monthly.
   - An AEMO system process, for example: *settlements*.

4.3 Report delivery

Participants receive reports in accordance with their preferred protocol, either:

1. An FTP response. The report is placed in your Participant File Server Outbox to retrieve.
2. An API response:
   - For Push the report is delivered to your Participant API Gateway.
   - For Pull the report is delivered to your Participant Hub Queue.

4.4 Report formats

Reports are delivered as a csv payload with the standard market aseXML wrapper. To ensure report payloads do not exceed the aseXML file limits the results of each report csv payload is restricted to several rows.

4.5 Report sequencing

To ensure participants receive all report data, a sequence number is included as the last column to many reports.

To restrict a report from exceeding the file size limit, a row limit is applied to each report response. For example, the RM9 Actual Verses Estimate Data Report has a row limit of 10000.

Where an RM report content exceeds the row limit, the payload is separated into multiple responses. So, if an RM9 report produced 19000 rows, the payload is separated into the following separate files:

1. File 1: The payload includes sequence numbers 1 to 10000.
2. File 2: The payload includes sequence numbers 10001 to 19000.

The last file is identified where the row quantity does not match the file size limit. If the number of rows for a report request match the file size limit (for example, the RM9 response has 10000, 20000, 30000, and so on rows) a blank file is created to identify the end of the report response.

Since RM reports provide all response data for each report request, the Report Last Sequence Number is not used if a value is provided.

4.6 aseXML report message format

To request an MDMT report, the participants system must generate a request that conforms to the applicable aseXML Schema.

Participants zip the aseXML document and upload it into MDM using the MSATS Browser interface, placing the file into your Participant Inbox on the Participant File Server or sending it as an aseXML payload using AEMO's market facing e-Hub APIs.

The aseXML document has three sections:

1. **Schema Information:** Details the aseXML schema version information and must not be modified unless AEMO releases an update.
2. **Header Information:** Contains information about the participant submitting the file, its destination, and the MDM reporting transaction group, MDMT.
3. **Transaction Information:** Contains transaction-specific information such as, the report type and report parameters.

Figure 8 below is an example of an aseXML file for an RM11 Missing Data report. The payload shows the structure of a transaction containing report parameters.

These examples refer to schema version r31. For details about the current aseXML schema, see aseXML Standards on AEMO's website.

Figure 8 MDMT aseXML Message Format

Schema Information

Header Information

Transaction Information

```
<?xml version="1.0" ?>
<ase:aseXML xmlns:ase="urn:aseXML:r31" xmlns:xsi="
http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="urn:aseXML:r31
http://www.nemmco.com.au/aseXML/schemas/r31/aseXML_r31.xsd">
  <Header>
    <From>PART1234</From>
    <To description="Australian Energy Market Operator Limited">NEMMCO</To>
    <MessageID>NEMMCO-MSG-608170170</MessageID>
    <MessageDate>2017-03-01T13:33:56+10:00</MessageDate>
    <TransactionGroup>MDMT</TransactionGroup>
    <Priority>Medium</Priority>
    <SecurityContext>PART1234</SecurityContext>
    <Market>NEM</Market>
  </Header>
  <Transactions>
    <Transaction transactionID="MDMT-608170170" transactionDate=
     "2017-03-01T13:33:56+10:00" initiatingTransactionID="22816831">
      <ReportRequest version="r10">
        <ReportParameters xsi:type="ase:MDMTMissingDataReportParameters">
          <ReportName>MissingData</ReportName>
          <FromDate>2010-10-26</FromDate>
          <ToDate>2010-11-01</ToDate>
          <AsAtDate>2017-03-01T00:00:00+10:00</AsAtDate>
          <LastSequenceNumber>0</LastSequenceNumber>
          <MDP>PART1234</MDP>
          <DataType>Consumption</DataType>
          <NMISelection>AllNMIs</NMISelection>
        </ReportParameters>
      </ReportRequest>
    </Transaction>
  </Transactions>
</ase:aseXML>
```

4.6.1 Header information

Table 1 below describes the fields for the Header section of the aseXML file. The format is important when creating your aseXML file. If a field entry is entered incorrectly, for example, not capitals when it should be, MDM may reject the file. See also, Header Information in Figure 8 on page 30~~on page 29~~.

An aseXML file with the Transaction Group of MDMT:

- Supports transactions of the type Meter Data Notification, Meter Data Response, Report Request, Report Response.
- Supports MDMT Report Request transactions for multiple RM report types.
- Cannot have both MDMT Meter Data Notifications and Report Request transactions.
- Cannot have transactions belonging to other Transaction Groups (for example, CATS reports types).

Table 1 Header information

Field Name	Description	Format	Example
<From>	The Participant ID of the participant submitting the file (MDP)	Must be upper case Maximum 8 characters	PART1234
<To>	The AEMO Participant ID	Must be upper case	NEMMCO
<Description>	Free-text field with the description of the submitted request	Upper or lower case Maximum 30 characters	Australian Energy Market Operator Limited
<MessageID>	Unique participant-generated identifier for the file	Maximum 50 characters	NEMMCO-MSG-608170170'
<MessageDate>	Date and time identifier	yyyy-mm-ddThh:mm:ss.sss+10:00	2019-04-10T05:55:27.000+10:00
<TransactionGroup>	Identifies the type of transaction processed	For the RM *metering data* reports the transaction group is always MDMT. This applies to *metering data* supplied through MDFF.	MDMT

Field Name	Description	Format	Example
<Priority>	Identifies the priority of the transaction and determines the order the transactions are processed		Medium
<SecurityContext>	Identifies the User ID of the Participant User submitting the file		USER1 JSMITH
<Market>	Identifies the market		NEM

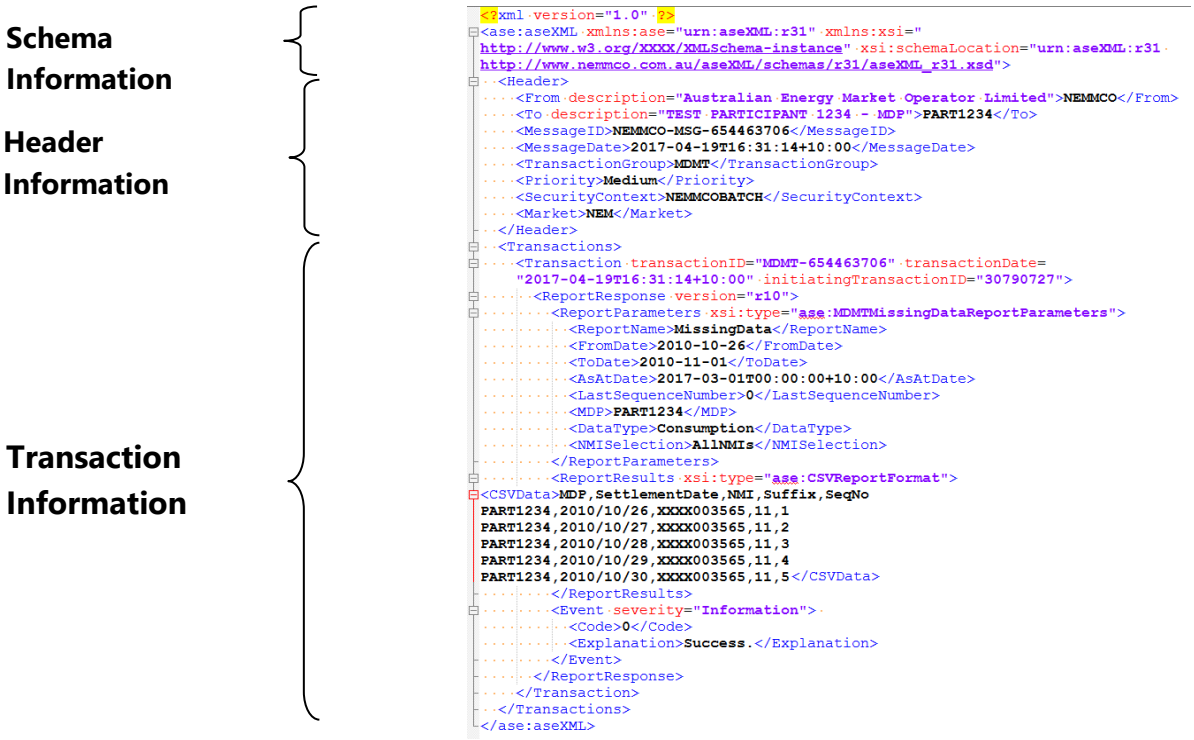
4.6.2 Transaction information

Figure 9 on page 33~~on page 32~~ is an example of an aseXML file for an MDMT Report Response with csv payload data.

The transaction information within an MDMT Report Response has:

- **transactionID:** An MDM System generated transaction ID for the MDMT ReportResponse.
- **transactionDate:** The date time that the MDMT Report Response report transaction was generated.
- **initiatingTransactionID:** The transaction ID of the initiating MDMT ReportRequest message.
- **ReportResponse:** The compiled report payload.
- **ReportParameters**: Parameters used within the request.
- **ReportResults:** The CSVData Response payload(s).
- **Event**: A standard aseXML element to report errors consistently.

Figure 9 MTRD aseXML Message Response




```
<?xml version="1.0" ?>
<ase:aseXML xmlns:ase="urn:aseXML:r31" xmlns:xsi="
http://www.w3.org/XXXX/XMLSchema-instance" xsi:schemaLocation="urn:aseXML:r31
http://www.nemmco.com.au/aseXML/schemas/r31/aseXML_r31.xsd">
  <Header>
    <From description="Australian Energy Market Operator Limited">NEMMCO</From>
    <To description="TEST PARTICIPANT 1234 - MDP">PART1234</To>
    <MessageID>NEMMCO-MSG-654463706</MessageID>
    <MessageDate>2017-04-19T16:31:14+10:00</MessageDate>
    <TransactionGroup>MDMT</TransactionGroup>
    <Priority>Medium</Priority>
    <SecurityContext>NEMMCOBATCH</SecurityContext>
    <Market>NEM</Market>
  </Header>
  <Transactions>
    <Transaction transactionID="MDMT-654463706" transactionDate=
      "2017-04-19T16:31:14+10:00" initiatingTransactionID="30790727">
      <ReportResponse version="r10">
        <ReportParameters xsi:type="ase:MDMTMissingDataReportParameters">
          <ReportName>MissingData</ReportName>
          <FromDate>2010-10-26</FromDate>
          <ToDate>2010-11-01</ToDate>
          <AsAtDate>2017-03-01T00:00:00+10:00</AsAtDate>
          <LastSequenceNumber>0</LastSequenceNumber>
          <MDP>PART1234</MDP>
          <DataType>Consumption</DataType>
          <NMISelection>AllNMIs</NMISelection>
        </ReportParameters>
        <ReportResults xsi:type="ase:CSVReportFormat">
<CSVData>MDP,SettlementDate,NMI,Suffix,SeqNo
PART1234,2010/10/26,XXXX003565,11,1
PART1234,2010/10/27,XXXX003565,11,2
PART1234,2010/10/28,XXXX003565,11,3
PART1234,2010/10/29,XXXX003565,11,4
PART1234,2010/10/30,XXXX003565,11,5</CSVData>
        </ReportResults>
        <Event severity="Information">
          <Code>0</Code>
          <Explanation>Success.</Explanation>
        </Event>
      </ReportResponse>
    </Transaction>
  </Transactions>
</ase:aseXML>
```

4.7 Multiple payload schemas

To minimise the impact of varying schema column numbers within report CSVData results, where the result contain data with 48, 96 or 288 reading periods, separate CSVData payloads are provided.

4.7.1 RM13 report examples

With 48, 96 and 288 reading periods there are three csv payloads

<ReportResults xsi:type="ase:CSVReportFormat">

<CSVData>SettlementDate,NMI,Suffix,LoadDT,MDPVersionDT,MDP,Period01,
…..,**Period48**,StatusFlags,SeqNo,A_H

</CSVData>

<CSVData>SettlementDate,NMI,Suffix,LoadDT,MDPVersionDT,MDP,Period01,
…..,**Period96**,StatusFlags,SeqNo,A_H

</CSVData>

<CSVData>SettlementDate,NMI,Suffix,LoadDT,MDPVersionDT,MDP,Period001,
…..,**Period288**,StatusFlags,SeqNo,A_H

</CSVData>

</ReportResults>

With 48 and 288 reading periods there are two csv payloads

```
<ReportResults xsi:type="ase:CSVReportFormat">

<CSVData>SettlementDate,NMI,Suffix,LoadDT,MDPVersionDT,MDP,Period01,
…..,Period48,StatusFlags,SeqNo,A_H

</CSVData>

<CSVData>SettlementDate,NMI,Suffix,LoadDT,MDPVersionDT,MDP,Period001,
…..,Period288,StatusFlags,SeqNo,A_H

</CSVData>

</ReportResults>
```

4.8 Changes to Existing MDM reports

The following reports are impacted as part of the 5MS changes.

4.8.1 RM11 - MDM Missing Data Report

This report lists all NMI Data Streams without data loaded ~~for a meter~~to support settlements.

The existing report identifies missing data for all~~matches suffixes in meter load data with~~ active NMI Data Stream Suffixes.

New logic ~~is included to cater~~ excludes the reporting ~~for~~ of missing Net reads where the *metering data* is received as Ex and Bx ~~MTRD NEM12 interval data~~with a corresponding MDM Data Stream Identifier to the active Net datastream.

The report is automated to become a push report scheduled prior to each settlement run based on the **MDP Data Delivery Calendar**.

Type	Code	Settlement schedule	Report schedule	Run time
Prelim	P	Tuesday for trading week	Monday (Schedule -1 day)	09:00
Final	F	Thursday for trading week	Wednesday (Schedule -1 day)	09:00
Revision 1	R1	Wednesday for trading week	Tuesday (Schedule -1 day)	09:00
Revision 2	R2	Thursday for trading week	Wednesday (Schedule -1 day)	09:00

4.8.2 RM13 – NMI Datastream History Report

Provides history of NMI Data Stream *metering data* with:

1. Possible multiple csv payloads to support different meter time intervals.

2. Inclusion of multiple Data Streams on receipt of MDFF files.

4.8.3 RM16 – Level 1 Settlement Reconciliation

Provides Level 1 reconciliation for aggregated interval data and has a csv payload to support the settlement time interval.

4.8.4 RM17 – Level 3 Settlement Reconciliation

Provides Level 3 reconciliation data for non-aggregated data with:

1. A csv payload to support the settlement time interval.
2. Inclusion of multiple Data Streams on receipt of MDFF files.

4.8.5 RM20 – Profile Shape Data Report

Provides profile shape data for each local area within a settlement period and has a csv payload to support the settlement time interval.

4.8.6 RM22 – Data Estimate Report

Details of settlement data estimated by AEMO during the settlement run with:

1. A csv payload to support the settlement time interval
2. Each active NMI Data Stream suffix used for settlements

4.8.7 RM26 – MDP Substitution and Estimation Report

Provides details of substitutions and estimations still current for a settlement week with:

1. A flag field increased to support the settlement time interval.
2. Each active NMI Data Stream suffix used for settlements.

4.9 New MDM reports

The following new MDM reports are added for this Release.

4.9.1 RM37High priority missing data report

Purpose	Allows identification of missing meter readings for ~~Interconnectors, Wholesale NMIs, and Generator's NMIs daily.~~NMI Classification codes: INTERCON, GENERATR, WHOLSAL, BULK, XBOUNDRY and DWHOLSAL
Content	A list of ~~TNSP connected NMI~~Connection Point Suffixes having missing data for each settlement day .
Context Type	HighPriorityMissingDataReportParameters
Roles	MDP, FRMP
Created	Pushed to MDPs each day after the completion of the meter read load process.
Delivery	Participant's preferred method. For details, see Report delivery on page 29~~on page 28~~.
Manual request	Pulled using a request method. For details, see Report requests on page 28~~on page 27~~.
Format	csv wrapped within the market standard aseXML.

RM37 Report parameters

Figure 10 on page 37~~below~~ is an example of the report parameters.

Field Name	Description	Example	Requirement
ReportName	Name of Report	HighPriorityMissingData	Mandatory
FromDate	Start date of data	2010-10-26	Mandatory
ToDate	End date of data	2010-11-01	Mandatory
AsAtDate	Reading load prior to date	2017-03-01t00:00:00+10:00	Mandatory
MDP	MDP for readings	PART1234	Optional

Figure 10 Example of RM37 report parameters

```
<ReportParameters xsi:type="ase:HighPriorityMissingDataReportParameters">
<ReportName>HighPriorityMissingData</ReportName>
<FromDate>2019-05-19</FromDate>
<ToDate>2019-05-25</ToDate>
<AsAtDate>2019-05-27T00:00:00+10:00</AsAtDate>
<LastSequenceNumber>0</LastSequenceNumber>
<MDP>PART1234</MDP>
</ReportParameters>
```

RM37 Output

Field	Description	Example
MDP	MDP Participant Code	PART1234
SettlementDate	Date of missing reading data	2019/05/19
NMI	NMI number of missing data	XXXX006316
Suffix	Data Stream suffix ID	B1
SeqNo	Row count	1

	A	B	C	D	E
1					
2	MDP	SettlementDate	NMI	Suffix	SeqNo
3	MDP123	12/04/2017	XXXX006316	N1	1
4	MDP123	13/04/2017	XXXX006316	N1	2
5	MDP123	14/04/2017	XXXX006316	N1	3
6	MDP123	15/04/2017	XXXX006316	N1	4
7	MDP123	16/04/2017	XXXX006316	N1	5
8	MDP123	17/04/2017	XXXX006316	N1	6
9	MDP123	18/04/2017	XXXX006316	N1	7
10	MDP123	12/04/2017	XXXX006424	E1	8
11	MDP123	13/04/2017	XXXX006424	E1	9
12	MDP123	14/04/2017	XXXX006424	E1	10
13	MDP123	15/04/2017	XXXX006424	E1	11
14	MDP123	16/04/2017	XXXX006424	E1	12

4.9.2 RM38Data stream missing data report

Purpose	Allows identification of missing Data Stream readings required to create a net Data Stream for the settlement week.
Content	A list of NMIs and Suffixes having missing data for each settlement day during the specified period. Checks if: - Data Stream 'Nx' is ~~registered~~ active in the CATS NMI Data Stream table. - NMIConfiguration in the MDFF file includes either: Ex, Bx, Dx, or Ax suffix - NMISuffix records are provided for each Ex, Bx, Dx, or Ax suffix.
Context Type	DatastreamMissingDataReportParameters
Role	MDP, FRMP
Created	Pushed to MDPs 1 business day prior to each settlement type run.

Delivery	Participants preferred method. For details, see Report delivery on page 29~~on page 28~~.
Manual request	Pulled using a request method. For details, see Report requests on page 28~~on page 27~~.
Format	csv wrapped within the market standard aseXML.

Figure 11 below is an example of the reporting parameters.

Figure 11 Example of RM38 reporting parameters

```
<ReportParameters xsi:type="ase:DataStreamMissingDataReportParameters">
<ReportName>DatastreamMissingData</ReportName>
<FromDate>2019-05-19</FromDate>
<ToDate>2019-05-25</ToDate>
<AsAtDate>2019-05-27T00:00:00+10:00</AsAtDate>
<LastSequenceNumber>0</LastSequenceNumber>
<MDP>PART1234</MDP>
</ReportParameters>
```

RM38 Report parameters

Field Name	Description	Example	Requirement
ReportName	Name of Report	DatastreamMissingData	Mandatory
FromDate	Start date of data	2010-10-26	Mandatory
ToDate	End date of data	2010-11-01	Mandatory
AsAtDate	Reading load prior to date	2017-03-01t00:00:00+10:00	Mandatory
MDP	MDP for readings	PART1234	Optional

RM38 Output

Field	Description	Example
MDP	MDP participant code	MDP123
SettlementDate	Date of missing reading data	2018/04/18

Field	Description	Example
NMI	NMI ~~number~~ of missing data	XXXX006316
Suffix	Data Stream suffix	B1
SeqNo	Row count	1

	A	B	C	D	E
1					
2	MDP	SettlementDate	NMI	Suffix	SeqNo
3	MDP123	12/04/2017	XXXX006316	E1	1
4	MDP123	13/04/2017	XXXX006316	E1	2
5	MDP123	14/04/2017	XXXX006316	E1	3
6	MDP123	15/04/2017	XXXX006316	E1	4
7	MDP123	16/04/2017	XXXX006316	E1	5
8	MDP123	17/04/2017	XXXX006316	E1	6
9	MDP123	18/04/2017	XXXX006316	E1	7
10	MDP123	12/04/2017	XXXX006424	E1	8
11	MDP123	13/04/2017	XXXX006424	E1	9
12	MDP123	14/04/2017	XXXX006424	E1	10
13	MDP123	15/04/2017	XXXX006424	E1	11
14	MDP123	16/04/2017	XXXX006424	E1	12
15	MDP123	17/04/2017	XXXX006424	E1	13
16	MDP123	18/04/2017	XXXX006424	E1	14

4.9.3 RM39Mismatch data report

Purpose	Allows Identification of Data Stream readings provided within a settlement week not having related *NMI Standing Data*.
Content	A list of all settlement Data Stream reads (for example: Ex, Bx, Dx, or Ax) received, not having a corresponding *NMI Standing Data* record for the reading period.
Context Type	MismatchDataReportParameters
Roles	MDP, FRMP
Created	Pushed to MDPs 1 business day prior to each settlement type run.
Delivery	Participants preferred method. For details, see Report delivery on page 29~~on page 28~~.
Manual request	Pulled using a requested method. For details, see Report requests on page 28~~on page 27~~.
Format	csv wrapped within the market standard aseXML.

RM39 Report parameters

Figure 12 on page 42~~below~~ is an example of the reporting parameters.

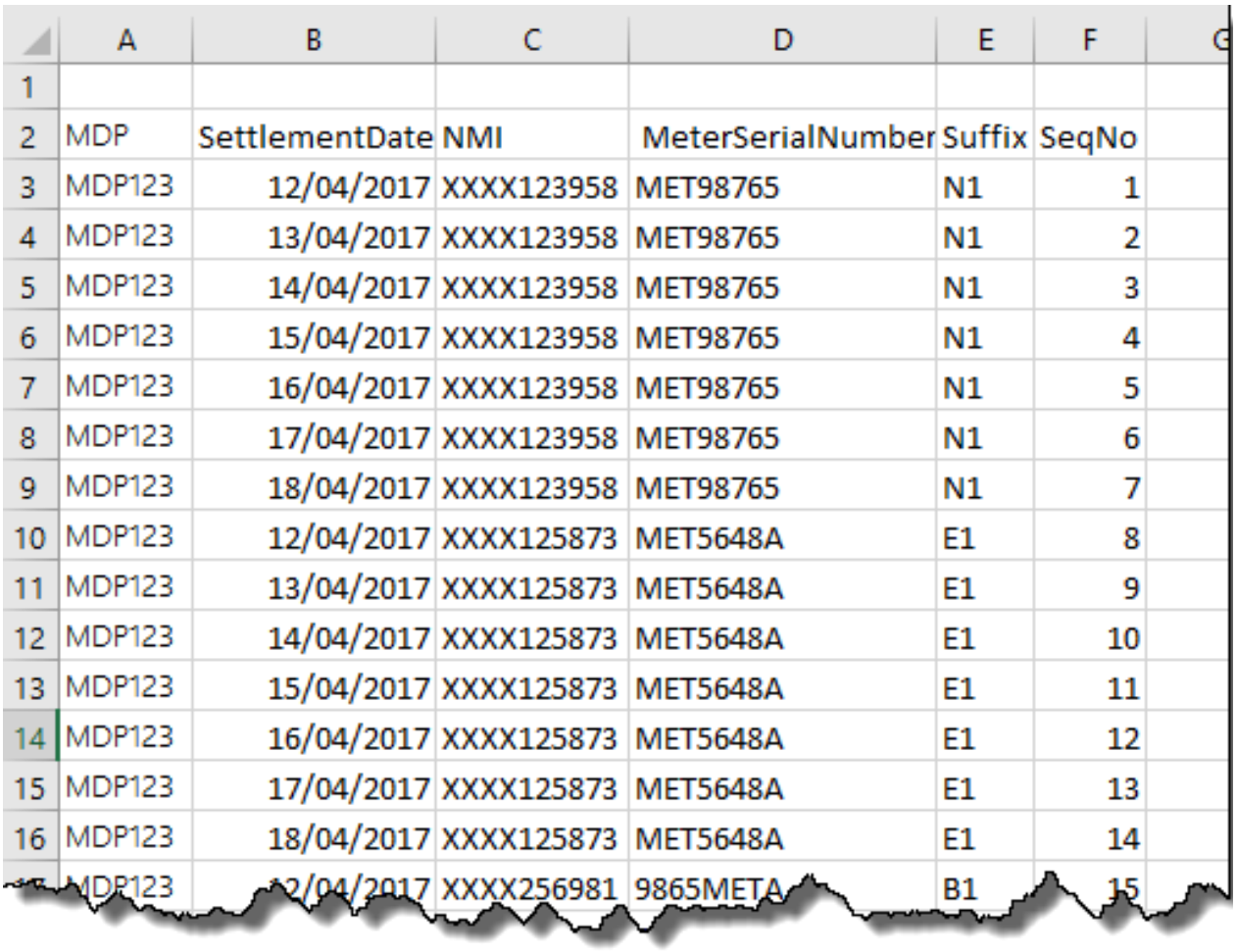
Field	Description	Example	Requirement
ReportName	Name of Report	MismatchData	Mandatory
FromDate	Start date of data	2010-10-26	Mandatory
ToDate	End date of data	2010-11-01	Mandatory
AsAtDate	Reading load prior to date	2017-03-01t00:00:00+10:00	Mandatory
MDP	MDP for readings	PART1234	Optional

Figure 12 Example of RM39 Reporting Parameters

```
<ReportParameters xsi:type="ase:MismatchDataReportParameters">
<ReportName>MismatchData</ReportName>
<FromDate>2019-05-19</FromDate>
<ToDate>2019-05-25</ToDate>
<AsAtDate>2019-05-27T00:00:00+10:00</AsAtDate>
<LastSequenceNumber>0</LastSequenceNumber>
<MDP>PART1234</MDP>
</ReportParameters>
```

RM39 Output

Field Name	Description	Example Data
MDP	MDP participant code	MDP123
SettlementDate	Date of missing reading data	2018/04/18
NMI	NMI number of missing data	VCCC006316
MeterSerialNumber	Meter number	METSER123
Suffix	Data Stream suffix	B1
MDPVerionDT	Date/Time reading taken by MDP	
SeqNo	Row count	1



	A	B	C	D	E	F	G
1							
2	MDP	SettlementDate	NMI	MeterSerialNumber	Suffix	SeqNo	
3	MDP123	12/04/2017	XXXX123958	MET98765	N1	1	
4	MDP123	13/04/2017	XXXX123958	MET98765	N1	2	
5	MDP123	14/04/2017	XXXX123958	MET98765	N1	3	
6	MDP123	15/04/2017	XXXX123958	MET98765	N1	4	
7	MDP123	16/04/2017	XXXX123958	MET98765	N1	5	
8	MDP123	17/04/2017	XXXX123958	MET98765	N1	6	
9	MDP123	18/04/2017	XXXX123958	MET98765	N1	7	
10	MDP123	12/04/2017	XXXX125873	MET5648A	E1	8	
11	MDP123	13/04/2017	XXXX125873	MET5648A	E1	9	
12	MDP123	14/04/2017	XXXX125873	MET5648A	E1	10	
13	MDP123	15/04/2017	XXXX125873	MET5648A	E1	11	
14	MDP123	16/04/2017	XXXX125873	MET5648A	E1	12	
15	MDP123	17/04/2017	XXXX125873	MET5648A	E1	13	
16	MDP123	18/04/2017	XXXX125873	MET5648A	E1	14	
17	MDP123	12/04/2017	XXXX256981	9865META	B1	15	

4.9.4 RM43UFE factor values by profile area

Purpose	Provides the factor profile of each interval within each Profile area for each settlement run.
Content	Calculation of UFE factor profile as part of the *settlements* process for each Local Area settlement day.
Context Type	UFEFactorValuesByProfileAreaParameters
Role	FRMP, LNSP
Created	Pushed at the end of each settlement run. AEMO, FRMP, and LNSP participants can pull the report.
Delivery	Participants preferred method. For details, see Report delivery on page 29~~on page 28~~.
Manual request	Requested after each settlement run using one of the request methods. For details, see Report requests on page 28~~on page 27~~.

Format	csv wrapped within the market standard aseXML.

RM43 Report Parameters

Field	Description	Example	Requirement
CaseID	Settlements Case ID	6382	Mandatory
ProfileArea	Name of Profile Area	CITIPOWER	Mandatory

RM43 output

Field Name	Description	Example Data
Case ID	Settlement Case ID	6860
Settlement Type	Settlement Type	FINAL
Profile Area	Profile Area	CITIPOWER
Settlement Date	Date of settlement	2019/02/06
Creation Date	Date of settlement Run	2019/02/09
Period001	Value for Period 001	0.56369
Period002	Value for Period 002	0.71051
Period.....	Value for Period nnn	n.nnnnn
Period288	Value for Period 288	0.65428

SettlementCaseID	SettlementType	ProfileArea	SettlementDate	CreationDate	Period001	Period002	Period003	Period004	Period005	Period006	Period007	Period008	Period009	Period010	Period011	Period012
6789	F	ACTEWAGL	06/02/2019	03/02/2019	0.08972	0.05792	0.06088	-0.01126	0.03297	0.01571	0.00415	0.01101	0.01869	0.02509	0.03019	0.03402
6789	F	ACTEWAGL	07/02/2019	03/02/2019	0.00040	0.00000	0.00029	-0.00006	0.00015	0.00007	0.00000	0.00001	0.00002	0.00003	0.00003	0.00002
6789	F	ACTEWAGL	08/02/2019	03/02/2019	0.01972	0.01373	0.01541	-0.00317	0.01073	0.00550	0.00161	0.00474	0.00896	0.01347	0.01826	0.02333
6789	F	ACTEWAGL	09/02/2019	03/02/2019	0.01703	0.00000	0.01078	-0.00187	0.00607	0.00271	0.00000	0.00057	0.00087	0.00102	0.00103	0.00088
6789	F	ACTEWAGL	10/02/2019	03/02/2019	0.93189	0.55642	0.54111	-0.08568	0.29501	0.13787	0.04424	0.09934	0.16674	0.22096	0.26181	0.28946
6789	F	ACTEWAGL	11/02/2019	03/02/2019	0.21175	0.12562	0.12569	-0.02041	0.06899	0.03237	0.01000	0.02313	0.03906	0.05211	0.06226	0.06954

4.10 Retired MDM reports

The metering working group approved the retirement of the following participant MDM reports:

Report	Description
RM8	Date BMP PPS Generated Report
RM14	MDP Data Version Comparison Report
RM15	Multiple Versions Report
RM18	Electricity Interval Data Report

4.11 Participant impact for reports

Participants using APIs to request and receive reports can see the impact for APIs on page 95~~on page 91~~.

5. Energy Profiling and Aggregation

A change in profiling methodology means Retailers and Distribution companies may need to change their reconciliation processes or checks. The changes to the profile shapes are published in:

1. **LOAD PROFILES**: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Metering/Load-Profiles
2. **METERING PACKAGE 1: METERING DATA:** https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Procedures-Workstream/Metering-package-1---Metering-data

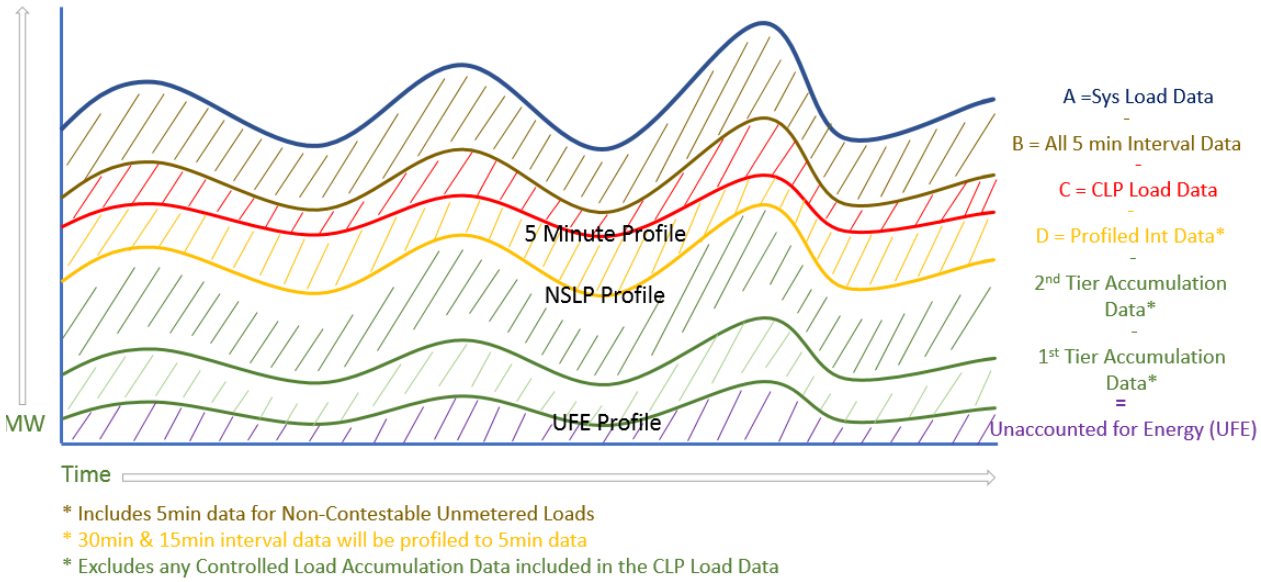
6. Unaccounted for Energy (UFE)

Unaccounted for Energy (UFE) is the remainder of energy flowing in or out of a local area after calculating the sum of all recorded load, generation, and *Distribution Network loss factors* (DLFs).

Currently, UFE is included with Tier 1 consumption and assigned to *Local retailers* (LRs). For 5-Minutes Settlements, AEMO calculates and reports the UFE proportioned for each FRMP.

6.1 UFE calculation example

Import (generation) 1000 kWh – { Export (load) 900 kWh + Loss Factor (DLF 1%) 9 kWh } = UFE 91 kWh



When 5-Minute Settlement goes live, AEMO continues to bundle UFE with the Tier 1 basic data and the Non-Contestable Unmetered Loads with the *Local retailer* (LR) settlement.

6.2 1 July 2021 – 2 February 2022

Between 1 July 2021 to 2 February 2022, AEMO must calculate UFE values and show how it is applied to each Retailer (FRMP) in a Global Settlements (GS) environment.

To provide an accurate UFE calculation all loads are set up in MSATS and metering data provided.

Market Participants are required to do the following in MSATS:

1. Create or update all Tier 1 NMIs having an active NMI Data Stream and provide MDP *metering data*.
2. Register Non-Contestable Unmetered Loads and provide MDP *metering data*.

6.3 Calculation of UFE for Market Participants

UFE is separately calculated for each local area and applied to each Retailer (FRMP) by the proportion of energy used in the local area.

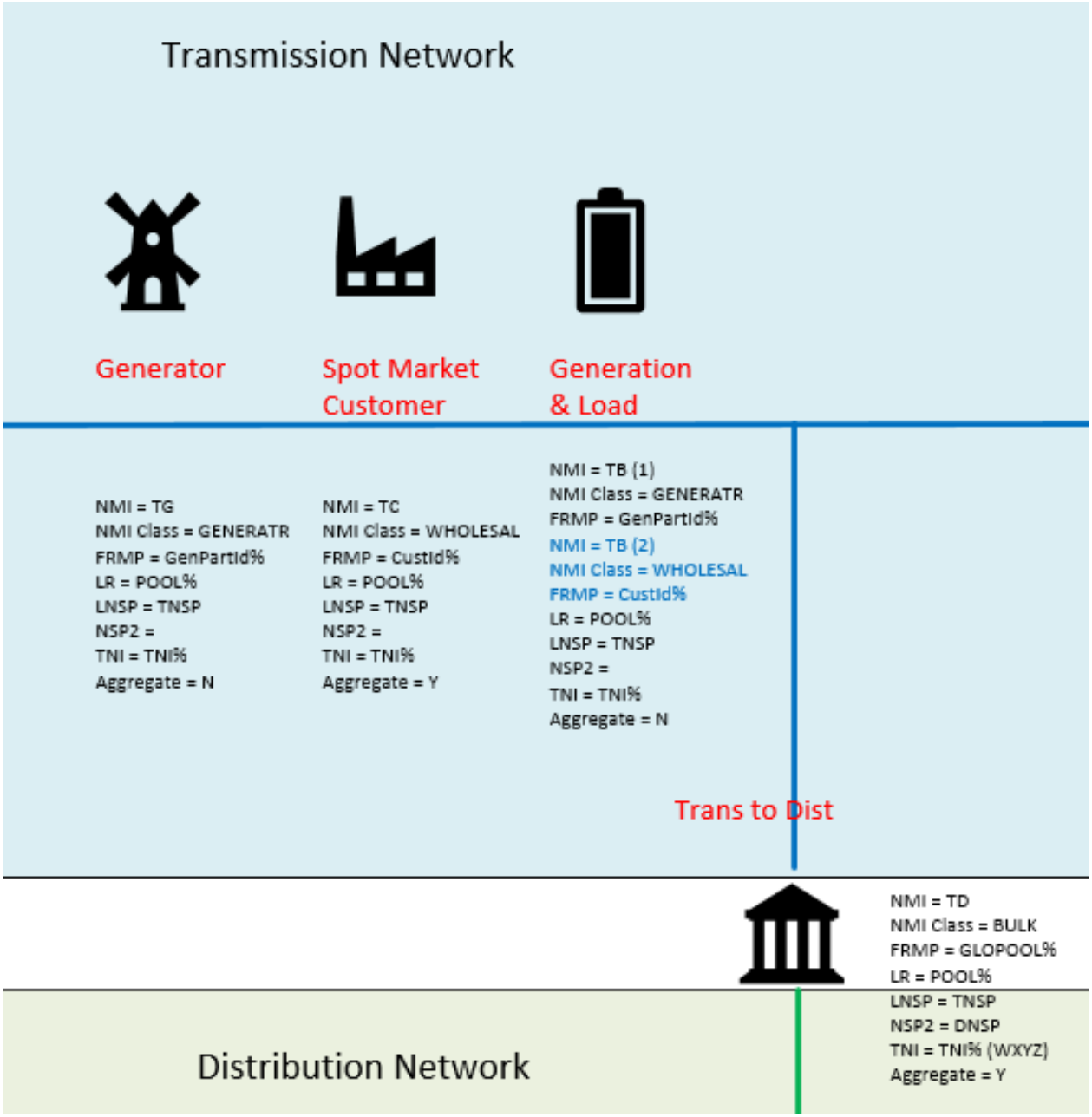
For example, Retailer 1 uses 404 kWh, Retailer 2 uses 202 kWh, and Retailer 3 uses 303 kWh. Continuing from the UFE calculation example on page 47~~on page 45~~.

1. UFE Retailer 1 = Energy Used 404 / Total Energy used 910 x Total UFE 91 = 40.44
2. UFE Retailer 2 = Energy Used 202 / Total Energy used 910 x Total UFE 91 = 20.22
3. UFE Retailer 3 = Energy Used 303 / Total Energy used 910 x Total UFE 91 = 30.33

6.4 Changes to NMI standing data

To assist the *settlement* process new *NMI* Classification Codes are created. Below are examples of the application of the new *NMI* Classification Codes.

6.4.1 Transmission network connection point examples



6.4.2 Changes for transmission network connection points:

Transmission network to *Distribution Network connection points* change to BULK to differentiate them from WHOLESAL customer connections.

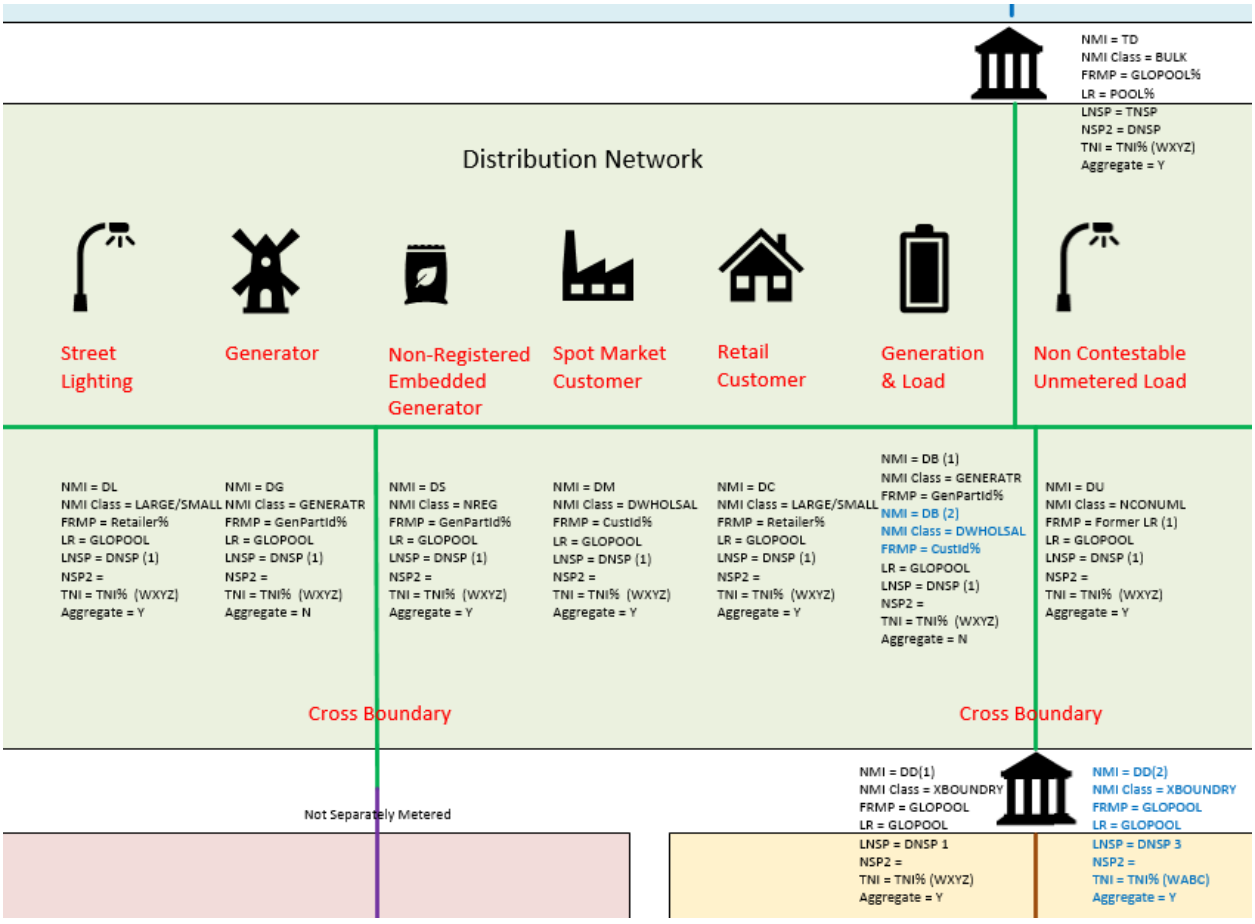
Participant changes for Global Settlements

Transmission Network to *Distribution Network connection points* have the Financial Responsible Market Participant (FRMP)
Participant ID changed to GLOPOOL.

~~*Transmission Network to Distribution Network connection points* have the *Local retailer* (LR) Participant ID changed to GLOPOOL.~~

***Local retailers* no longer receive boundary *metering data*.**

6.4.3 Distribution network connection point examples



6.4.4 Changes for distribution network connected points

A new Non-Registered Embedded Generator code of NREG is included to separate registered and non-registered Generators.

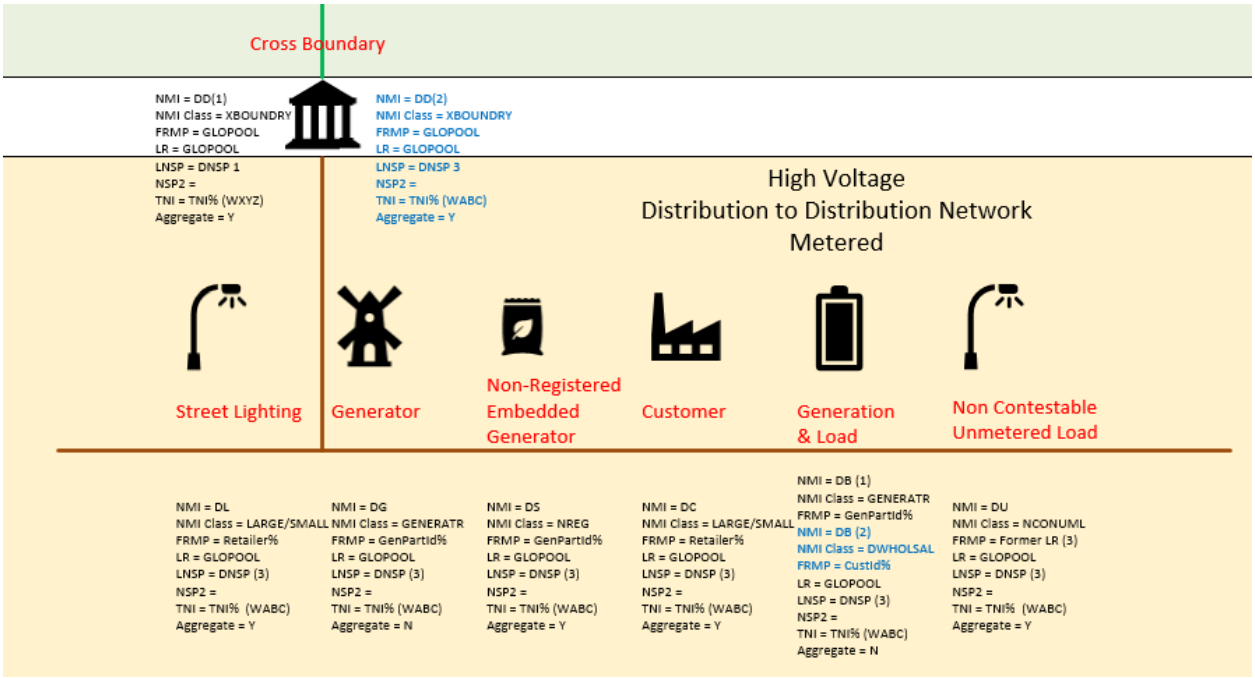
A new *Distribution Network* wholesale code of DWHOLSAL is introduced to distinguish *Distribution Network connection points* purchasing from the Spot Market form the *Transmission Network connection points*.

A new Non-Contestable Unmetered Load code of NCONUML is introduced.

Participant changes for Global Settlements

All *Distribution Network connection points* have the *Local retailer* (LR) Participant ID changed to GLOPOOL where the *connection point* is not an *embedded network* child.

6.4.5 ~~High Voltage~~Metered Distribution network to adjoining Distribution network connection point examples



6.4.6 Changes for metered cross boundary connection points:

Distribution Network to adjacent *Distribution Network* ~~*High Voltage* (HV)~~*metered connection points* ~~are metered.~~

A new Cross Boundary code of XBOUNDRY is introduced to differentiate them from WHOLESAL customer connections.

A second TNI code is assigned to record the receipt *Distribution Network* TNI code.

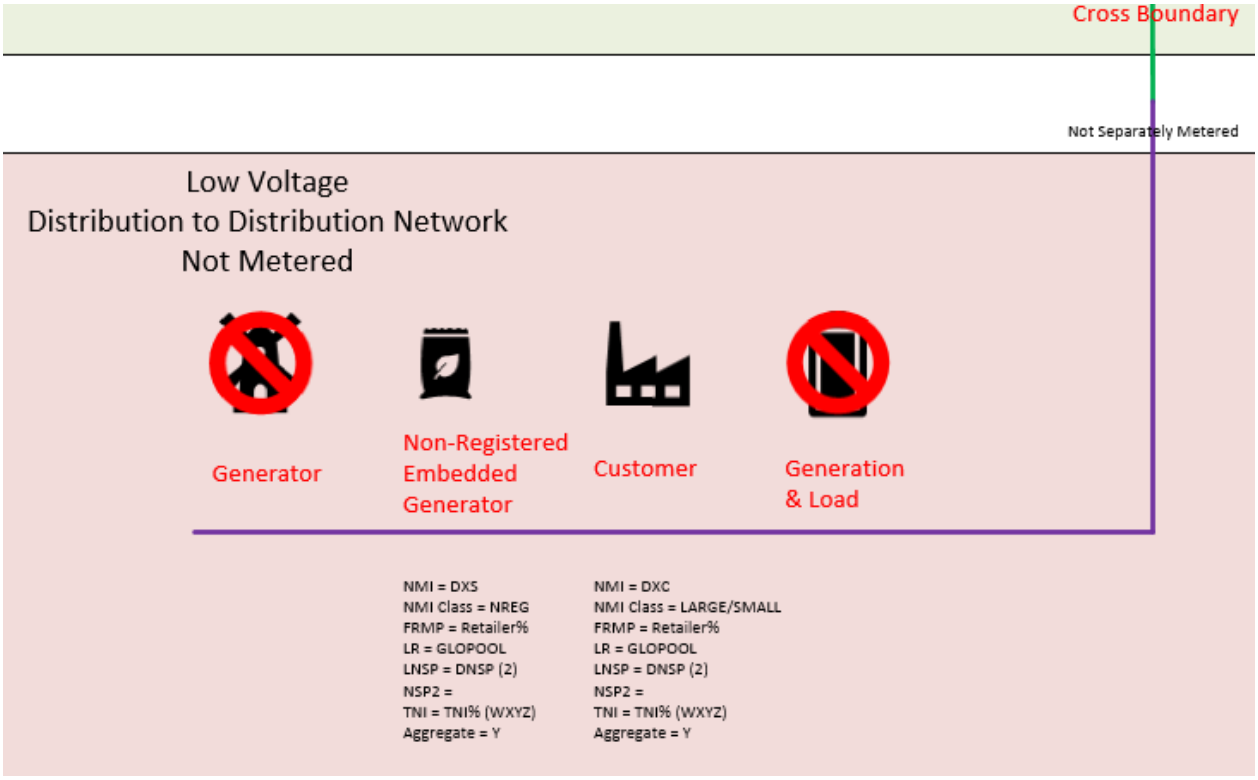
Cross Boundary connection point metering must be supplied for LV connections, where the receiving distribution network load can be altered (example new connection points) without the supplying distribution network knowledge.

Participant changes for Global Settlements

The *Local retailer* (LR) and Financial Responsible Market Participant (FRMP) are changed to GLOPOOL for all cross-boundary *connection points*.

All *Distribution Network connection points* have the *Local retailer* (LR) Participant ID changed to GLOPOOL where the *connection point* is not an *embedded network child*.

6.4.7 ~~Low Voltage~~Unmetered Distribution network to adjoining Distribution network connection point examples.



6.4.8 Changes for unmetered cross boundary connected points

TNI codes for each of the end-use *connection points* in the receiving local area **must** have the *Transmission Network* supplying TNI code.

Generator and battery connections are not accepted without boundary metering.

Participant changes for Global Settlements

All *Distribution Network connection points* have the *Local retailer* (LR) Participant ID changed to GLOPOOL where the connection point is not an *embedded network* child.

6.5 Summary of changes for UFE

6.5.1 Prior to 5-Minute Settlements

1. All Tier 1 NMIs must have an active NMI Data Stream in MSATS.
2. Metering data is provided to AEMO for all Tier 1 NMIs.
3. All Non-Contestable Unmetered Loads are registered in MSATS.
4. Metering data is provided to AEMO for all Non-Contestable Unmetered Loads.
5. NMI Classifications are updated for existing *connection points*.
3. *Distribution Network* to *Distribution Network High Voltage* (HV) cross-boundary supplies are metered.
4. A *connection point* is registered for each *Distribution Network* area for cross-boundary metering.

6.5.2 Global Settlements go-live

1. The FRMP is updated on *Transmission Network* to *Distribution Network* and *Distribution Network* to *Distribution Network connection points*.
2. The *Local Retailer* is updated on all *Distribution Network connected points*, excluding *embedded network* child *connection points*.
3. *Local Retailers* no longer receive local area *metering data*.

7. APIs

7.1 API types

The following APIs are available for participants to manage their retail B2M communications :

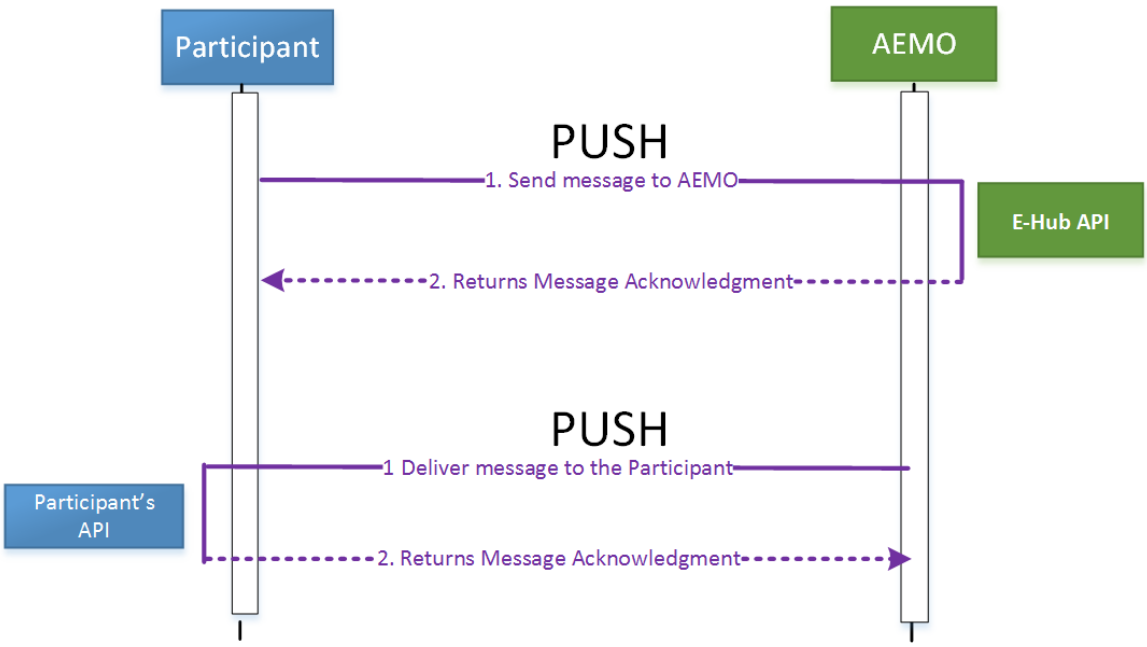
1. MSATS Web Services, for details, see Guide to Web Services.
2. A new set of APIs supporting an inbound Push protocol.
3. A new set of APIs supporting either an outbound Push or Pull protocol.
4. A new set of APIs supporting B2M message management.

7.1.1 Asynchronous API Push-Push

The Push-Push API requires API implementation at:

1. The AEMO e-Hub (API Gateway and API Portal).
2. The Participant API Gateway.

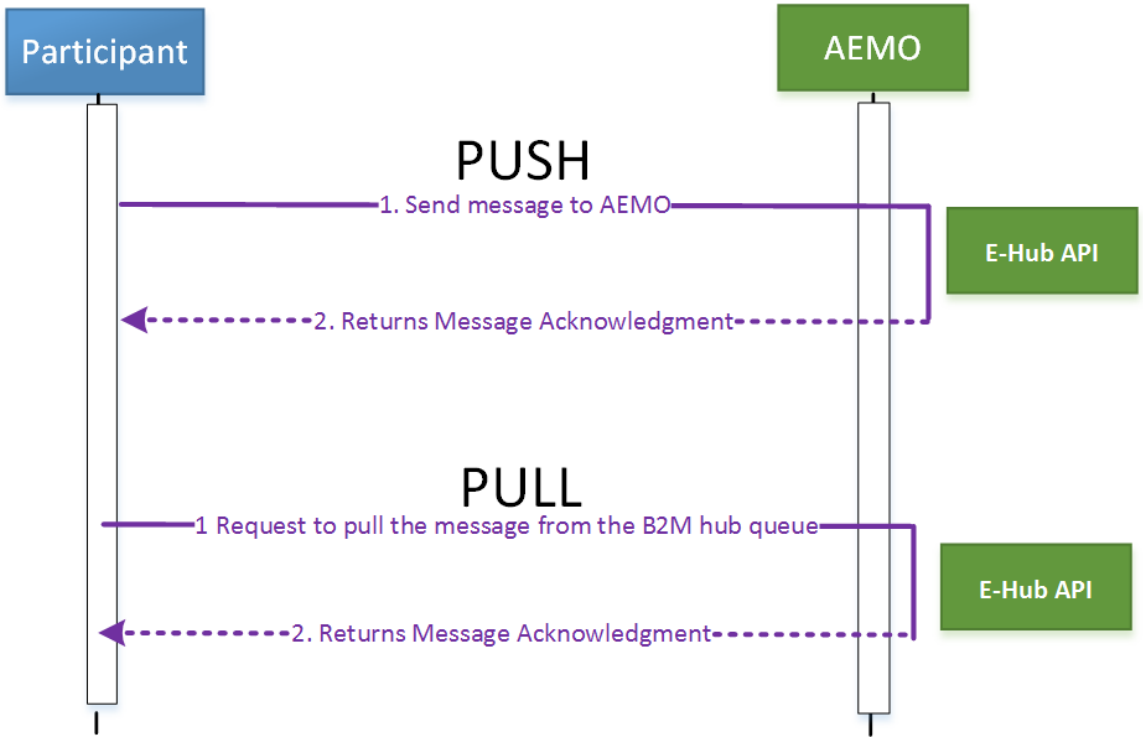
Figure 13 Push-Push message pattern



7.1.2 Asynchronous API Push-Pull

The Push-Pull API requires implementation only at the AEMO e-Hub.

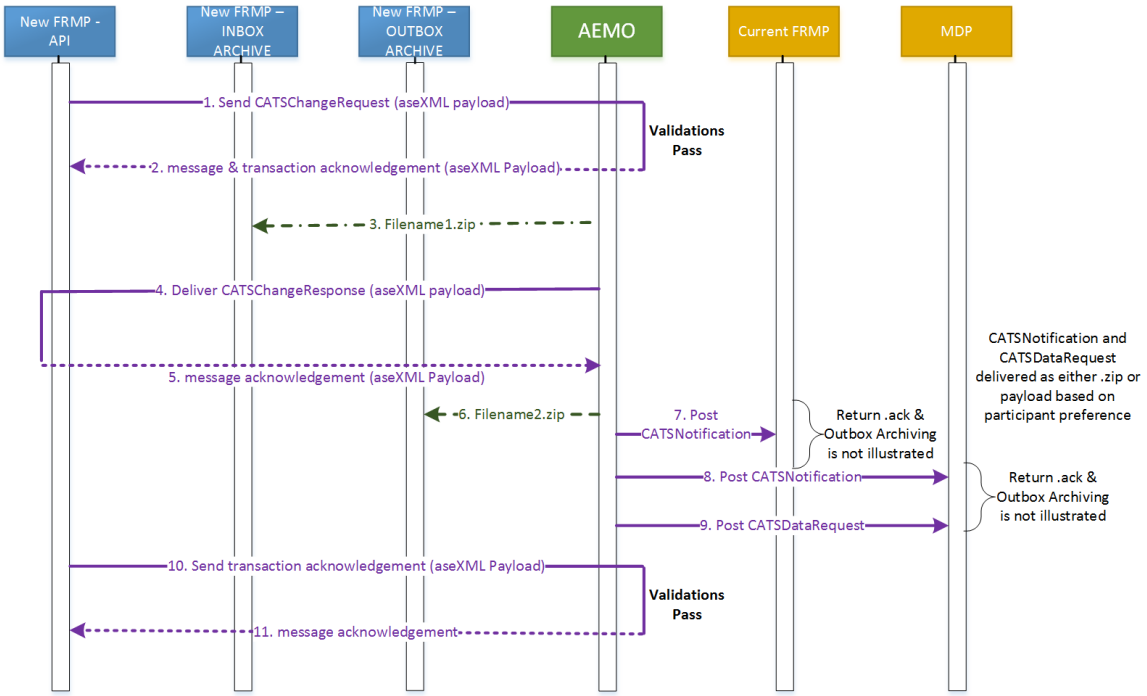
Figure 14 Push-Pull message pattern



7.1.3 Submission API Push > Receipt API Push

This diagram describes the common message and transaction exchange processes for B2M transactions when participants submit an API and invoke a second API to receive messages (Asynchronous API Push-Push).

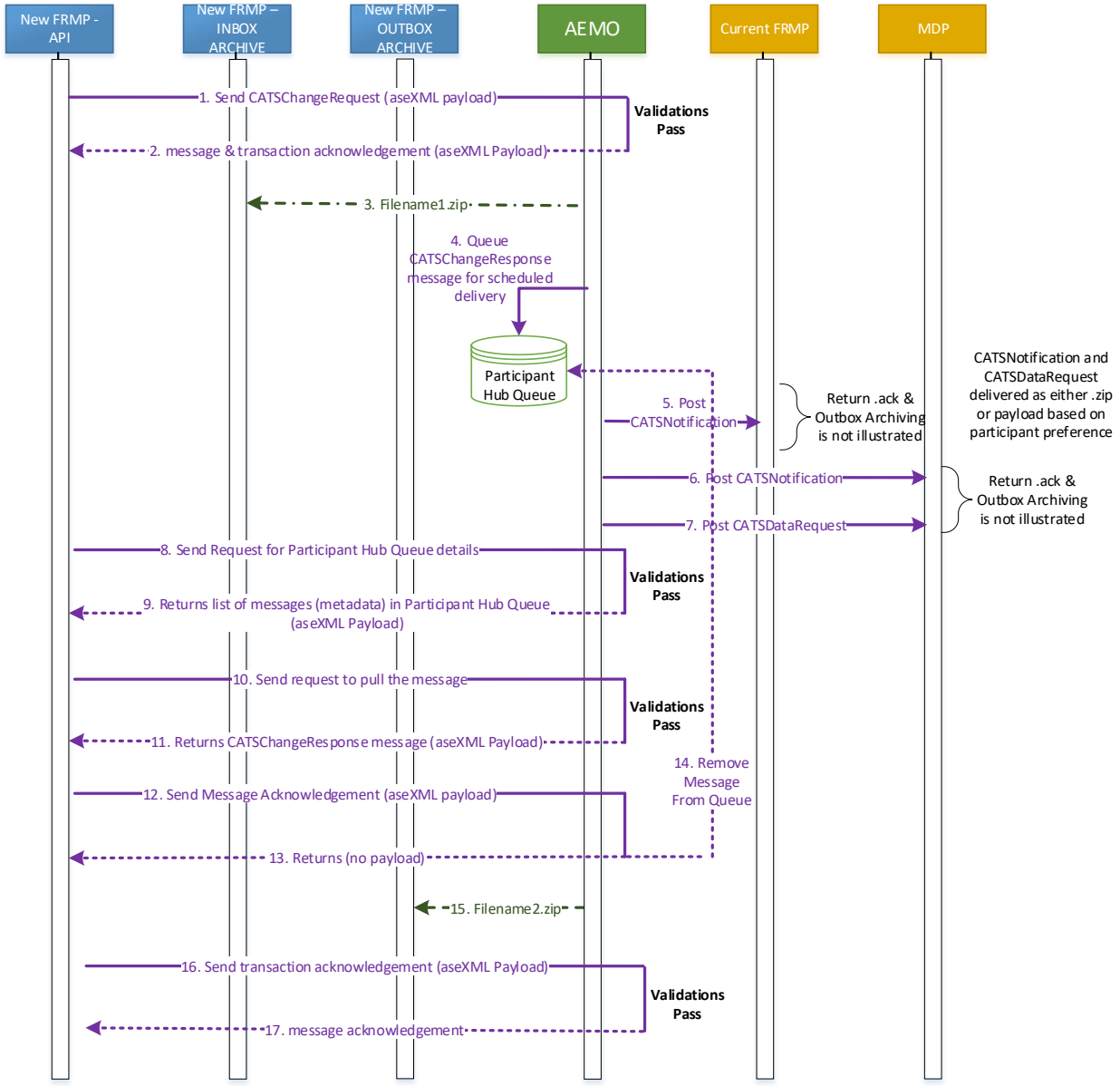
Figure 15 Submission API Push-Push - Receipt API Push-Push



7.1.4 Submission API Push > Receipt API Pull

This diagram describes the common message and transaction exchange processes for B2M transactions when participants submit an API and invoke a second API to receive messages (Asynchronous API Push-Pull).

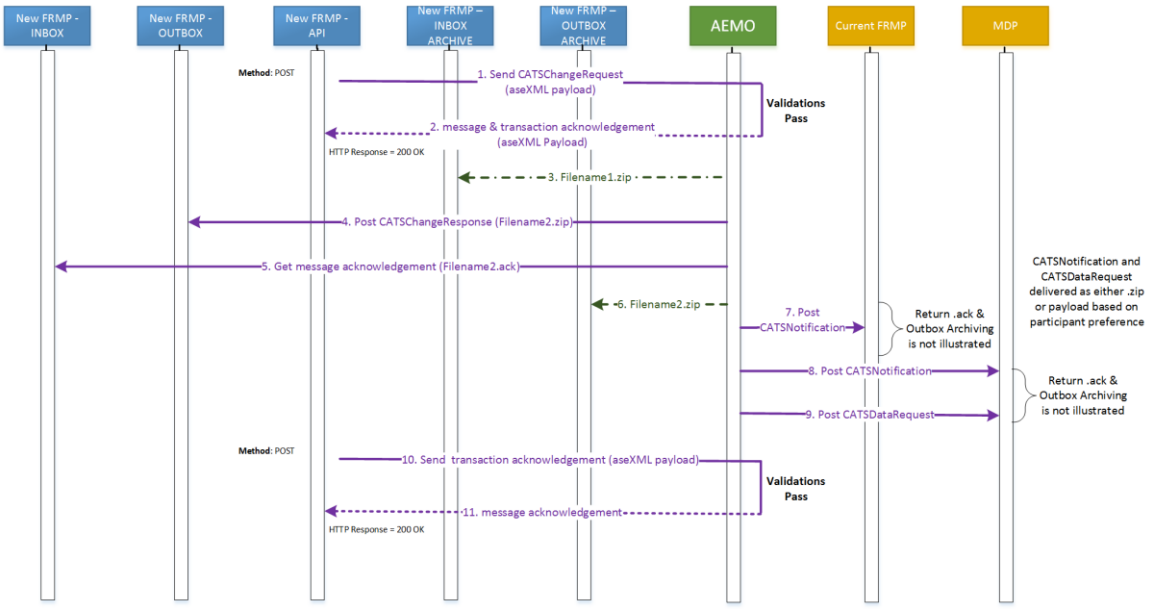
Figure 16 Submission API Push > Receipt API Pull



7.1.5 Submission API Push > Receipt FTP Participant File Server

This diagram describes the common message exchange protocol for all B2M transactions when participants submit an API and receive by FTP Participant File Server.

Figure 17 INBOX API Push > OUTBOX FTP Participant File Server



7.1.6 Submission API Push > Receipt API Pull/Push or FTP process

Step	Initiator	Action	Recipient	Receipt API Push	Receipt API Pull	Receipt FTP
1.	New FRMP	Sends CATSChangeRequest API	AEMO			
2.	AEMO	Validates and sends message and transaction acknowledgement Determines the protocol preference for B2M messaging	New FRMP	HTTP Response	HTTP Response	HTTP Response
3.	AEMO	Sends the CATSChangeResponse	New FRMP	API	Participant Hub Queue	Participant File Server Outbox
4.	FRMP	Validates the CATSChangeResponse, sends a message and then a transaction acknowledgment	AEMO			

Step	Initiator	Action	Recipient	Receipt API Push	Receipt API Pull	Receipt FTP
5.	AEMO	Sends CATSNotification	Current FRMP and all participant assigned to a role on the change request (except new FRMP)	API	Participant Hub Queue	Participant File Server Inbox
6.	AEMO	Sends CATSDataRequest for the Actual Change Date	MDP	API	Participant Hub Queue	Participant File Server Inbox
7.	New FRMP	Sends request for Participant Hub Queue details	AEMO	n/a	API to Participant Hub Queue	n/a
8.	AEMO	Returns list (metadata) of messages	New FRMP	n/a	API	n/a
9.	New FRMP	Send request to pull a message	AEMO	n/a	API	n/a
10	AEMO	Sends CATSChangeResponse	New FRMP	API	API to Participant Hub queue.	Participant File Server Inbox
11	New FRMP	Sends transaction acknowledgment.	AEMO	API	API to Participant Hub Queue.	Participant File Server Inbox
12	AEMO	Validates the incoming message and sends a message acknowledgment.	New FRMP	HTTP response	HTTP response	Participant File Server Outbox

7.2 B2MMessagingSync

Participants can use this API to retrieve the following resources:

1. generateC4Report

~~2.~~ NMIDiscovery

~~3.~~2.~~retrieveMeterData~~

4.3.retrieveMSATSLimitsgetMSATSLimits

5.4.retrieveNMIDetailgetNMIDetail

6.5.retrieveParticipantSystemStatusgetParticipantSystemStatus

7.2.1 API parameters

Parameter	Description
Content Type	text/xml or application/zip
Accept	text/xml or application/zip
Authorization	Two-way SSL and Basic Auth
System	MSATS/CATS

7.2.2 generateC4Report

Description	Method	URL
Provides a single NMI Master (C4) report	GET	NEMRetail/B2MMessagingSync/v2/generateC4Report/msats/ws/C4/<participantId>

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionId	Yes	
NMI	Yes	
fromDate	Yes	YYYY-MM-DD

Parameter	Required	Description/Format
toDate	Yes	YYYY-MM-DD
asatDate	Yes	YYYY-MM-DD
roleId	No	e.g. FRMP
inittransid	No	

Response

Response code	Payload
200 OK	asexML NMI discovery response
500	No payload

7.2.3 NMIDiscovery

Description	Method	URL
Provides a list of NMIs matching the search criteria for the 3 types of NMI Discovery search: 1. Delivery point identifier (DPID) 2. meter serial 3. Address	GET	NEMRetail/B2MMessagingSync/v2/~~msats/ws/~~NMIDiscovery~~/<participantId>~~

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionId	Yes	
jurisdictionCode	Yes	
deliveryPointIdentifier	No	Mandatory if searching by DPID

Parameter	Required	Description/Format
meterSerialNumber	No	Mandatory if searching by meter serial number
buildingOrPropertyName	No	
locationDescriptor	No	
lotNumber	No	
flatOrUnitType	No	
flatOrUnitNumber	No	
floorOrLevelType	No	
floorOrLevelNumber	No	
houseNumber	No	
houseNumberSuffix	No	
streetName	No	
streetSuffix	No	
streetType	No	
suburbOrPlaceOrLocality	No	
pPostcode	No	
stateOrTerritory		Mandatory if searching by address

Response

Response code	Payload
200 OK	asexML report response transaction
500	No payload

7.2.4 ~~retrieveMSATSLimits~~getMSATSLimits

Description	Method	URL
Provides the current status of MSATS Limits. If the participant is a member of a group then the limits are the group limits, otherwise they are the participant limits	GET	NEMRetail/B2MMessagingSync/v22/~~msats/ws~~/getMSATSLimits~~/<participantId>/~~

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionId	Yes	

Response

Response code	Payload
200 OK	asexML report response transaction
500	No payload

7.2.5 getNMIDetail~~retrieveNMIDetail~~

Description	Method	URL
Provides details of a specified NMI. Based on the input parameters returns the NMI Detail or Role Data	GET	NEMRetail/B2MMessagingSync/v2/~~msats/ws/~~getNMIDetail/~~<participantId>~~

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionId	Yes	
nmi	Yes	
checksum	Yes	
type	No	
reason	No	

Response

Response code	Payload
200 OK	asexML NMI Standing Data response
500	No payload

7.2.6 ~~retrieveParticipantSystemStatus~~getParticipantSystemStatus

Description	Method	URL
Provides the current participant system status	GET	NEMRetail/B2MMessagingSync/v2~~/msats/ws~~/getParticipantSystemStatus~~ParticipantSystemStatus/<participantId>~~

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionId	Yes	

Response

Response code	Payload
200 OK	asexML report response transaction
500	No payload

7.3 B2MMessagingAsync

Participants can use this API to submit and retrieve the following B2M resources:

1. submitMessages
2. submitMessageAcknowledgements
3. ~~retrieveQueueMetaData~~getQueueMetaData

7.3.1 API parameters

Parameter	Description
Content Type	Application/xml
Accept	Application/xml
Authorization	Two-way SSL and Basic Auth
Transaction Groups	CATS, HMGT, MDMT, NMID,

7.3.2 submitMessages

Description	Method	URL
Submit messages and transaction acknowledgements to AEMO's market systems	POST	NEMRetail/B2MMessagingAsync/v1/~~msats/ws/~~submitMessages

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18}
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

Response

Response code	Payload
200 OK	asexML Message Acknowledgment (with optional TACK)
500	No payload

7.3.3 submitMessageAcknowledgements

Description	Method	URL
Submit messages acknowledgements to AEMO's market systems	POST	NEMRetail/B2MMessagingAsync/v1/submitMessageAcknowledgements~~NEMRetail/B2MMessagingAsync/v1/msats/ws/submitMessageAcknowledgements~~

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18}
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

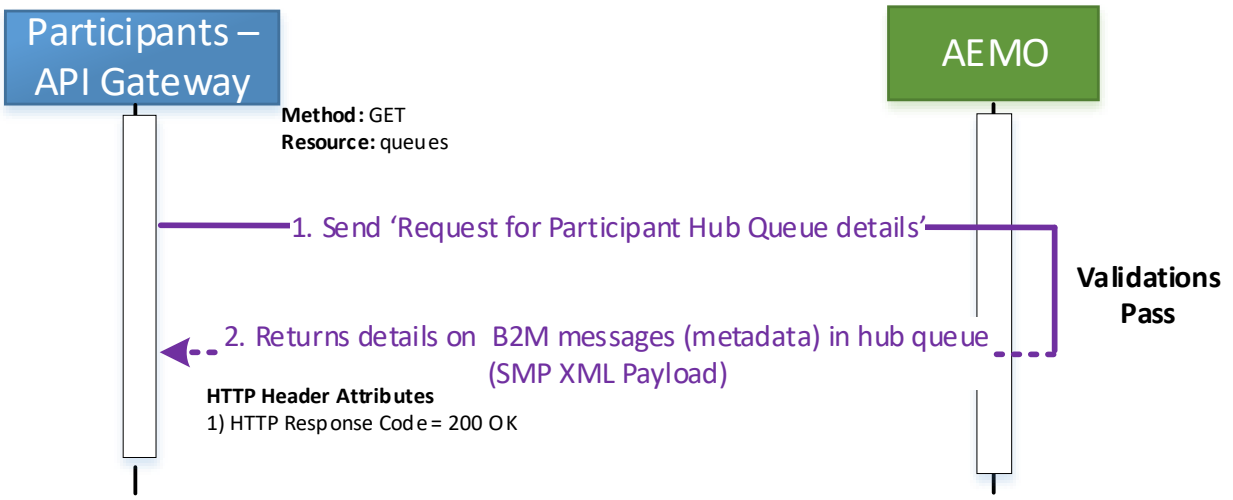
Response

Response code	Payload
200 OK	No payload
500	No payload

7.3.4 getQueueMetaData

This is a new API allowing participants to query the Participant Hub Queue for metadata for messages stored in the Participant Hub Queue (maximum 100 messages).

Description	Method	URL
View details of messages queued in the Participant Hub Queue	GET	NEMRetail/B2MMessagingAsync/v1/getQueueMetaDataNEMRetail/B2MMessagingAsync/v1/msats/ws/getQueueMetaData?<X-initiatingParticipantID>



Step	initiator	Process Step Definition	Recipient
1.	Participant Gateway	Retrieve details of the messages queued in the Participant Hub Queue	AEMO e-Hub
2.	AEMO e-Hub	Sends the metadata of the messages in the Participant Hub Queue in the aseXML payload (HTTP response payload) using the HubQueueReport transaction type.	Participant Gateway

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

Response

Response code	Payload
200 OK	aseXML Transaction payload – Transaction Type: HubQueueReport.
500	No payload

~~JSON request example~~

```
{
  "type": "object",
  "required": [
    "HubQueueReport"
  ],
  "properties": {
    "HubQueueReport": {
      "type": "object",
      "required": [
        "ResultCount",
        "MessageDetails"
      ],
      "properties": {
        "ResultCount": {
          "type": "string"
        },
        "MessageDetails": {
          "type": "object",
          "required": [
            "MessageMetaData"
          ],
          "properties": {
            "MessageMetaData": {
              "type": "array",
              "items": {
                "type": "object",
                "required": [
                  "TransactionGroup",
                  "Priority",
                  "FromParticipantID",
                  "MessageID",
                  "MessageType",
                  "MessageContextID",
                  "ReceivedDateTime"
                ],
                "properties": {
                  "TransactionGroup": {
```

```
                    "type": "string"
                },
                "Priority": {
                    "type": "string",
                    "enum": ["High", "Medium", "Low"]
                },
                "FromParticipantID": {
                    "type": "string"
                },
                "MessageID": {
                    "type": "string",
                    "maxLength": 36
                },
                "InitiatingMessageID": {
                    "type": "string",
                    "maxLength": 36
                },
                "MessageType": {
                    "type": "string",
                    "enum": ["Transaction Message", "Transaction
Acknowledgement", "Message Acknowledgement"]
                },
                "MessageContextID": {
                    "type": "string",
                    "maxLength": 50
                },
                "ReceivedDateTime": {
                    "type": "string"
                }
            }
        }
    }
}
```

Response example - success http code 200

```
<?xml version="1.0" ?>
<ase:aseXML xsi:schemaLocation="urn:aseXML:r37
http://www.nemmco.com.au/aseXML/schemas/r37/aseXML_r37.xsd"
xmlns:ase="urn:aseXML:r37" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
   <Header>
      <From description="National Electricity Market Management
Company">NEMMCO</From>
      <To description="RECIPIENT Pty Ltd">RECIPIENT</To>
      <MessageID>B2B-180319103024920-b28a8b8d92ce4d6c</MessageID>
      <MessageDate>2019-03-18T10:30:24.920+10:00</MessageDate>
      <TransactionGroup>HMGT</TransactionGroup>
      <Priority>Low</Priority>
      <Market>NEM</Market>
```

```
   </Header>
   <Transactions>
      <Transaction transactionID="B2B-180319103024920-b28a8b8d92ce4d6c"
transactionDate="2019-03-18T10:30:24.920+10:00">
         <HubQueueReport version="r37">
            <ResultCount>2</ResultCount>
            <MessageDetails>
               <MessageMetaData>
                  <TransactionGroup>CATS</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Message</MessageType>

<MessageContextID>catsm_RECIPIENT_730393109</MessageContextID>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
               <MessageMetaData>
                  <TransactionGroup>NMID</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Acknowledgement</MessageType>

<MessageContextID>catsl_RECIPIENT_730391291</MessageContextID>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
            </MessageDetails>
         </HubQueueReport>
      </Transaction>
   </Transactions>
</ase:aseXML>
```

7.3.5 Participant Implementation

The API push participants will implement an API which e-Hub would consume to send the requests via API. Participants can define their URL and the API name. The e-Hub only registers the API name of the participant. Participants are required to implement the following resources and methods on their APIs to accept the messages / message acknowledgements from the e-Hub.

Resource	Method	Description	Mandatory Header parameters
submitMessages	POST	Accept aseXML payload. Respond with a 200 OK and an optional aseXML MACK payload. If the response code is not 200, the message will be delivered again	messageContextID

7.4 B2MMessagingPull

Participants can use this API to submit and retrieve the following B2M resources:

1. submitMessages
2. submitMessageAcknowledgements
3. ~~retrieveMessages~~getMessages
4. ~~retrieveQueueMetaData~~getQueueMetaData

7.4.1 API parameters

Parameter	Description
Content Type	Application/xml
Accept	Application/xml
Authorization	Two-way SSL and Basic Auth
Transaction Groups	CATS, HMGT, MDMT, NMID~~,~~

7.4.2 submitMessages

Description	Method	URL
Submit messages and transaction acknowledgements to AEMO's market systems	POST	NEMRetail/B2MMessagingPull/v1/ ~~msats/ws/~~submitMessages

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18}
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

Response

Response code	Payload
200 OK	asexML Message Acknowledgment (with optional TACK)
500	No payload

7.4.3 submitMessageAcknowledgements

Description	Method	URL
Submit messages acknowledgements to AEMO's market systems	POST	NEMRetail/B2MMessagingPull/v1/submitMessageAcknowledgements~~NEMRetail/B2MMessagingPull/v1/msats/ws/submitMessageAcknowledgements~~

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18}
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

Response

Response code	Payload
200 OK	No payload
500	No payload

7.4.4 get~~retrieve~~Messages

Description	Method	URL
Retrieve queued messages	GET	NEMRetail/B2MMessagingPull/v1/get~~msats/ws/retrieve~~Messages

Header parameters

Parameter	Required	Description/Format
messageContextID	~~Yes~~No	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18} If not provided transactionGroup must be provided and~~,~~ the ~~first~~ oldest message in the queue (FIFO) ~~queued message~~ is retrieved~~.~~
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM
transactionGroup	No	Valid values are: CATS, MDMT, NMID If messageContextID is not provided this parameter is conditionally mandatory. Where messageContextID is not provided and transactionGroup is populated the resource will pull the message(s) matching the transactionGroup; providing the oldest message in the queue (FIFO) Note: If an invalid transactionGroup is passed, the API will send HTTP response code of 500 stating that transaction group is invalid

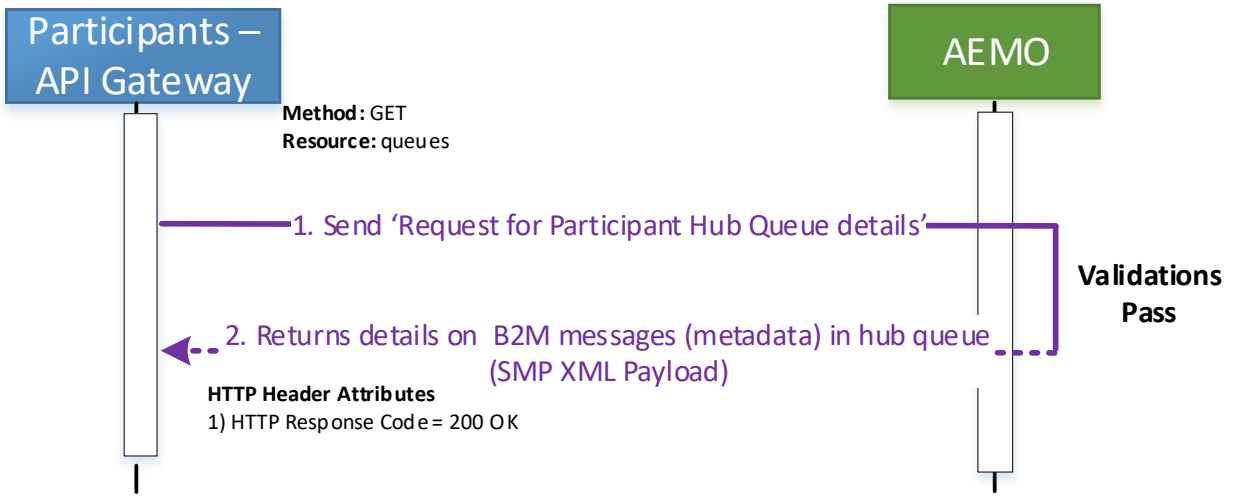
Response

Response code	Payload
200 OK	asexML Message Acknowledgment (with optional TACK)
500	No payload

7.4.5 ~~retrieveQueueMetaData~~getQueueMetaData

This is a new API allowing participants to query the Participant Hub Queue for metadata for messages stored in the Participant Hub Queue. The maximum number of messages the service can return is configurable by AEMO and is initially set to 100.

Description	Method	URL
View details of messages queued in the Participant Hub Queue	GET	NEMRetail/B2MMessagingPull/v1/getQueueMetaData~~NEMRetail/B2MMessagingPull/v1/msats/ws/retrieveQueueMetaData~~



Step	initiator	Process Step Definition	Recipient
1.	Participant Gateway	Retrieve details of the messages queued in the Participant Hub Queue	AEMO e-Hub
2.	AEMO e-Hub	Sends the metadata of the messages in the Participant Hub Queue in the aseXML payload (HTTP response payload) using the HubQueueReport transaction type.	Participant Gateway

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID

Parameter	Required	Description/Format
X-market	Yes	NEM

Response

Response code	Payload
200 OK	aseXML Transaction payload – Transaction Type: HubQueueReport.
500	No payload

Response example - success http code 200

~~JSON request example~~

```
{
  "type": "object",
  "required": [
    "HubQueueReport"
  ],
  "properties": {
    "HubQueueReport": {
      "type": "object",
      "required": [
        "ResultCount",
        "MessageDetails"
      ],
      "properties": {
        "ResultCount": {
          "type": "string"
        },
        "MessageDetails": {
          "type": "object",
          "required": [
            "MessageMetaData"
          ],
          "properties": {
            "MessageMetaData": {
              "type": "array",
              "items": {
                "type": "object",
                "required": [
                  "TransactionGroup",
                  "Priority",
                  "FromParticipantID",
                  "MessageID",
                  "MessageType",
                  "MessageContextID",
                  "ReceivedDateTime"
                ],
                "properties": {
                  "TransactionGroup": {
```

~~"type": "string"~~
~~},~~
~~"Priority": {~~
~~"type": "string",~~
~~"enum": ["High", "Medium", "Low"]~~
~~},~~
~~"FromParticipantID": {~~
~~"type": "string"~~
~~},~~
~~"MessageID": {~~
~~"type": "string",~~
~~"maxLength": 36~~
~~},~~
~~"InitiatingMessageID": {~~
~~"type": "string",~~
~~"maxLength": 36~~
~~},~~
~~"MessageType": {~~
~~"type": "string",~~
~~"enum": ["Transaction Message", "Transaction Acknowledgement", "Message Acknowledgement"]~~
~~},~~
~~"MessageContextID": {~~
~~"type": "string",~~
~~"maxLength": 50~~
~~},~~
~~"ReceivedDateTime": {~~
~~"type": "string"~~
~~}~~
~~}~~
~~}~~
~~}~~
~~}~~
~~}~~
~~}~~
~~}~~

```
<?xml version="1.0" ?>
<ase:aseXML xsi:schemaLocation="urn:aseXML:r37 http://www.nemmco.com.au/aseXML/schemas/r37/aseXML_r37.xsd" xmlns:ase="urn:aseXML:r37" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
   <Header>
      <From description="National Electricity Market Management Company">NEMMCO</From>
      <To description="RECIPIENT Pty Ltd">RECIPIENT</To>
      <MessageID>B2B-180319103024920-b28a8b8d92ce4d6c</MessageID>
      <MessageDate>2019-03-18T10:30:24.920+10:00</MessageDate>
      <TransactionGroup>HMGT</TransactionGroup>
      <Priority>Low</Priority>
      <Market>NEM</Market>
   </Header>
   <Transactions>
      <Transaction transactionID="B2B-180319103024920-b28a8b8d92ce4d6c" transactionDate="2019-03-18T10:30:24.920+10:00">
         <HubQueueReport version="r37">
```

```
            <ResultCount>2</ResultCount>
            <MessageDetails>
               <MessageMetaData>
                  <TransactionGroup>CATS</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Message</MessageType>
                  <MessageContextID>catsm_RECIPIENT_730393109</MessageContextID
>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
               <MessageMetaData>
                  <TransactionGroup>NMID</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Acknowledgement</MessageType>
                  <MessageContextID>catsl_RECIPIENT_730391291</MessageContextID
>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
            </MessageDetails>
         </HubQueueReport>
      </Transaction>
   </Transactions>
</ase:aseXML>
```

7.5 HubMessageManagement

Participants can use this API to receive B2B and B2M stop file alerts.

7.5.1 API parameters

Parameter	Description
Content Type	Application/xml
Accept	Application/xml
Authorization	Two-way SSL and API Key
Transaction Groups	CATS, HMGT, MDMT, NMID,

7.5.2 Alerts

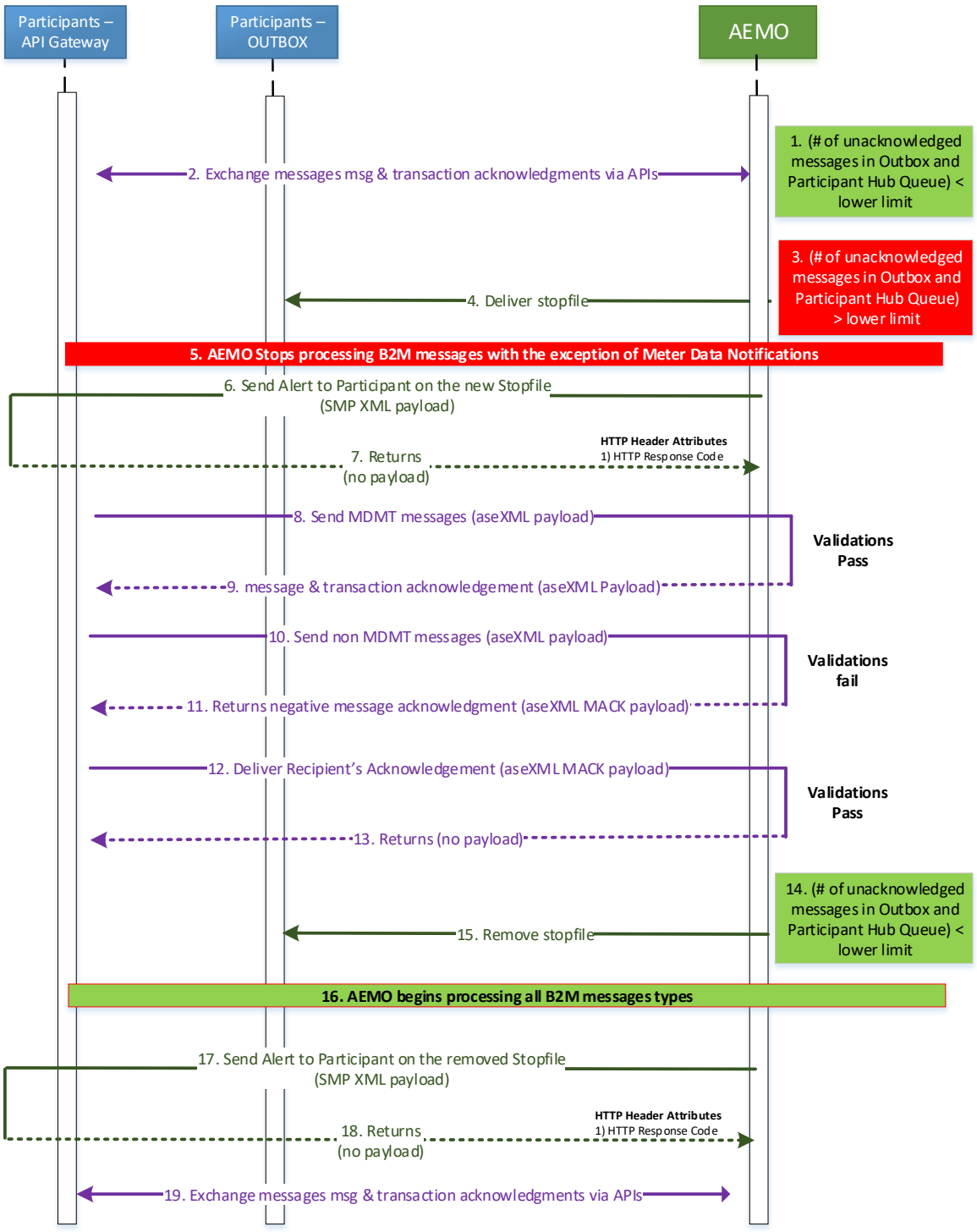
Description	Method	URL
The API gateway determines the endpoint depending on the alertType header parameter.	GET	ws/HubMessageManagement/1.0/alerts~~ws/HubMessageManagement/1.0/msats/ws/retrieveFlowControlStatus~~ ~~ws/HubMessageManagement/1.0/rest/AEMO_SMP_APIS_B2B/HUBMESSAGEMANAGEMENT/alerts~~

7.5.3 Flow control stop notification

This diagram describes the new Stop File process for participants using APIs with a scenario, where:

For participants receiving B2M communications through the FTP Participant File Server, the Stop File process remains unchanged.

1. A response payload sent by a participant fails validation.
2. The message acknowledgment was submitted using an asynchronous API.
3. The validation failure is notified to the participant using an alerts API resource.


Participants – API Gateway
Participants – OUTBOX
AEMO
1. (# of unacknowledged messages in Outbox and Participant Hub Queue) < lower limit
2. Exchange messages msg & transaction acknowledgments via APIs
3. (# of unacknowledged messages in Outbox and Participant Hub Queue) > lower limit
4. Deliver stopfile
5. AEMO Stops processing B2M messages with the exception of Meter Data Notifications
6. Send Alert to Participant on the new Stopfile (SMP XML payload)
7. Returns (no payload)
HTTP Header Attributes
1) HTTP Response Code
8. Send MDMT messages (aseXML payload)
Validations Pass
9. message & transaction acknowledgement (aseXML Payload)
10. Send non MDMT messages (aseXML payload)
Validations fail
11. Returns negative message acknowledgment (aseXML MACK payload)
12. Deliver Recipient's Acknowledgement (aseXML MACK payload)
Validations Pass
13. Returns (no payload)
14. (# of unacknowledged messages in Outbox and Participant Hub Queue) < lower limit
15. Remove stopfile
16. AEMO begins processing all B2M messages types
17. Send Alert to Participant on the removed Stopfile (SMP XML payload)
18. Returns (no payload)
HTTP Header Attributes
1) HTTP Response Code
19. Exchange messages msg & transaction acknowledgments via APIs

7.5.4 API stop file process

Step	Initiator	Action	Recipient
1.	Participant	Same as steps 1—2 in Submission API Push > Receipt API Push~~Submission API Push > Receipt API Push~~ on page 56~~on page 54~~	AEMO
2.	Participant	Unacknowledged messages in the B2M Outbox and the Participant Hub Queue exceed the lower limit As participants can nominate the outbound protocol for B2M messages by transaction group, it is possible to have unacknowledged messages in the Participant Hub Queue and the B2M Outbox.	AEMO
3.	AEMO	Delivers a Stop File to the B2M Outbox	Participant
4.	AEMO	Does not process any messages except Meter Data Notifications	Participant
5.	AEMO	Issues an API alert notification indicating a stop file is issued using the Transaction type - HubFlowControlAlertNotification	Participant
6.	AEMO	Continues processing Meter Data Notifications to the API interface (and the B2M Outbox)	Participant
7.	AEMO	Does not process B2M messages other than Meter Data Notification B2M messages submitted using API or FTP result in a negative acknowledgment detailing the type of B2M stop file placed	Participant
8.	Participant	Progressively acknowledges the non-Meter Data Notification messages in their Participant Hub Queue and/or B2M Outbox. Participants can nominate the outbound protocol B2M messages by transaction group, so acknowledged messages can be in the Participant Hub Queue and the B2M Outbox	AEMO
9.	AEMO	Removes the stop file from the B2M Outbox because the number of unacknowledged messages in the Participant Hub Queue and/or B2M Outbox fall below the lower limit defined	Participant
10	AEMO	Resumes processing of all B2M messages	Participant
11	AEMO	Issues an API alert notification indicating the stop file is lifted using the HubFlowControlAlertNotification transaction type	Participant
12	AEMO	Returns no Payload	Participant
13	Participant	Resumes normal B2M communications using APIs	AEMO

Header parameters

Parameter	Required	Description/Format
~~X-~~initiatingParticipantID	Yes	Participant ID
alertType	No	Values: - B2BStopFile - B2MStopFile The default value is B2BStopFile.
queryParticipantID	No	Used for B2B alerts. If provided, the alerts for the Participant ID are returned.
x-eHub-APIKey	Yes	AEMO-supplied API key.

Response

Response code	Payload
200 OK	asexML Message Acknowledgment or NO payload
500	No payload

~~JSON request example~~

```
{
  "type": "object",
  "required": [
    "HubFlowControlReport"
  ],
  "properties": {
    "HubFlowControlReport": {
      "type": "object",
      "required": [
        "ResultCount",
        "FlowControlStandingData"
      ],
      "properties": {
        "ResultCount": {
          "type": "string"
        },
        "FlowControlStandingData": {
          "type": "object",
          "required": [
            "FlowControlAlert"
          ],
          "properties": {
            "FlowControlAlert": {
              "type": "array",
              "items": {
                "type": "object",
```

```
                "required": [
                  "AlertType",
                  "StopfileName",
                  "Cause",
                  "StopDateTime"
                ],
                "properties": {
                  "AlertType": {
                    "type": "string",
                    "maxLength": 50
                  },
                  "StopfileName": {
                    "type": "string"
                  },
                  "Cause": {
                    "type": "string",
                    "maxLength": 80
                  },
                  "StopDateTime": {
                    "type": "string"
                  }
                }
              }
            }
          }
        }
      }
    }
  }
}
```


Response example - success http code 200


```
<?xml version="1.0"?>
<ase:aseXML xsi:schemaLocation="urn:aseXML:r37
http://www.nemmco.com.au/aseXML/schemas/r37/aseXML_r37.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:ase="urn:aseXML:r37">
  <Header>
    <To description="RECIPIENT Pty Ltd">RECIPIENT</To>
    <From description="National Electricity Market Management
Company">NEMMCO</From>
    <MessageID>B2M-170419093023143-4379b71c84da487c</MessageID>
    <MessageDate>2019-04-17T09:30:23.144+10:00</MessageDate>
    <TransactionGroup>HMGT</TransactionGroup>
    <Priority>Low</Priority>
    <Market>NEM</Market>
  </Header>
  <Transactions>
    <Transaction transactionID="B2B-170419093023143-4379b71c84da487c"
transactionDate="2019-04-17T09:30:23.144+10:00">
      <HubFlowControlReport version="r37">
        <RequestParameters>
          <Parameter>
            <Name>initiatingParticipantID</Name>
```

```
            <Value>RECIPIENT</Value>
          </Parameter>
        </RequestParameters>
        <ResultCount>32</ResultCount>
        <FlowControlStandingData>
          <FlowControlAlert>
            <AlertType>B2MStopFile</AlertType>
            <ParticipantID>RECIPIENT</ParticipantID>
            <StopfileName>HOLDINP.STP</StopfileName>
            <Cause>CR NOTIFICATION</Cause>
            <StopDateTime>2018-08-17T09:42:37.304+10:00</StopDateTime>
          </FlowControlAlert>
          <FlowControlAlert>
            <AlertType>B2MStopFile</AlertType>
            <ParticipantID>RECIPIENT</ParticipantID>
            <StopfileName>HOLDINP.STP</StopfileName>
            <Cause>OUTBOX FILE</Cause>
            <StopDateTime>2018-02-20T15:25:13.120+10:00</StopDateTime>
          </FlowControlAlert>
          <FlowControlAlert>
            <AlertType>B2MStopFile</AlertType>
            <ParticipantID>RECIPIENT</ParticipantID>
            <StopfileName>HOLDINP.STP</StopfileName>
            <Cause>NSRD RESPONSE</Cause>
            <StopDateTime>2018-02-20T15:24:49.111+10:00</StopDateTime>
          </FlowControlAlert>
        </FlowControlStandingData>
      </HubFlowControlReport>
    </Transaction>
  </Transactions>
</ase:aseXML>
```

7.5.5 submitMessageAcknowledgements

Description	Method	URL
Submit messages acknowledgements to AEMO's market systems	POST	NEMRetail/B2MMessagingPull/v1/~~msats/ws/~~submitMessageAcknowledgements

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18}
X-initiatingParticipantID	Yes	Participant ID

Parameter	Required	Description/Format
X-market	Yes	NEM

Response

Response code	Payload
200 OK	No payload
500	No payload

7.5.6 ~~retrieveMessages~~getMessages

Description	Method	URL
Retrieve queued messages	GET	NEMRetail/B2MMessagingPull/v1~~/msats/ws~~/get~~retrieve~~Messages

Header parameters

Parameter	Required	Description/Format
messageContextID	Yes	[TransactionGroup 0-9_a-z]{1,4} + [Priority h|m|l] + "_" + [FromParticipantID]{1,10} + "_" + [0-9_a-z]{1,18} If not provided, the first queued message is retrieved.
X-initiatingParticipantID	Yes	Participant ID
X-market	Yes	NEM

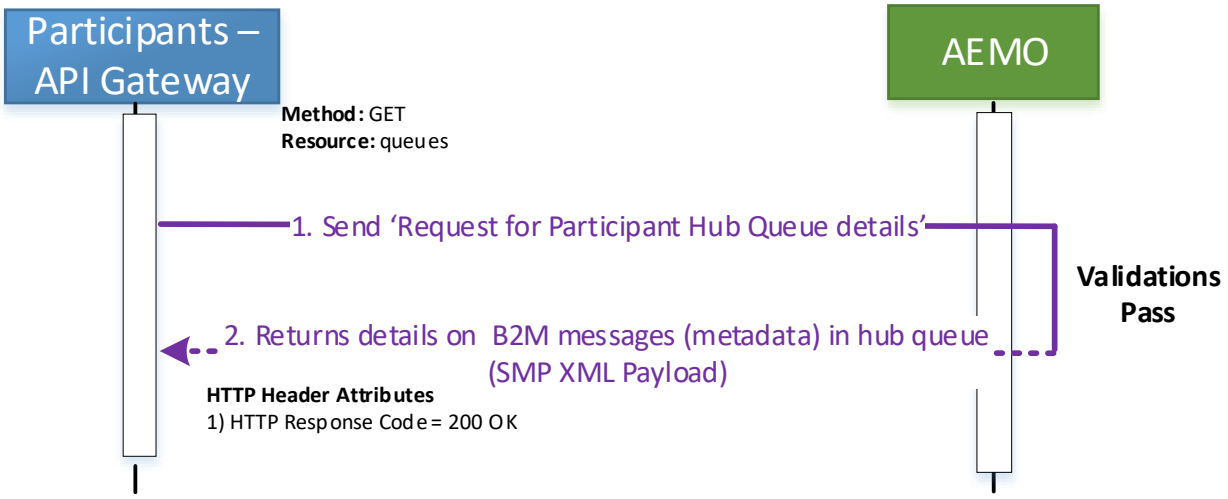
Response

Response code	Payload
200 OK	asexML Message Acknowledgment (with optional TACK)
500	No payload

7.5.7 getretrieveQueueMetaData

This is a new API allowing participants to query the Participant Hub Queue for metadata for messages stored in the Participant Hub Queue.

Description	Method	URL
View details of messages queued in the Participant Hub Queue	GET	NEMRetail/ B2MMessagingPull/v1/getQueueMetaDataNEMRetail/ B2MMessagingPull/v1/msats/ws/retrieveQueueMetaData



Step	initiator	Process Step Definition	Recipient
1.	Participant Gateway	Retrieve details of the messages queued in the Participant Hub Queue	AEMO e-Hub
2.	AEMO e-Hub	Sends the metadata of the messages in the Participant Hub Queue in the aseXML payload (HTTP response payload) using the HubQueueReport transaction type.	Participant Gateway

Header parameters

Parameter	Required	Description/Format
X-initiatingParticipantID	Yes	Participant ID

Parameter	Required	Description/Format
X-market	Yes	NEM

Response

Response code	Payload
200 OK	aseXML Transaction payload – Transaction Type: HubQueueReport.
500	No payload

Response example - success http code 200

```
<?xml version="1.0" ?>
<ase:aseXML xsi:schemaLocation="urn:aseXML:r37
http://www.nemmco.com.au/aseXML/schemas/r37/aseXML_r37.xsd"
xmlns:ase="urn:aseXML:r37" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
   <Header>
      <From description="National Electricity Market Management
Company">NEMMCO</From>
      <To description="RECIPIENT Pty Ltd">RECIPIENT</To>
      <MessageID>B2B-180319103024920-b28a8b8d92ce4d6c</MessageID>
      <MessageDate>2019-03-18T10:30:24.920+10:00</MessageDate>
      <TransactionGroup>HMGT</TransactionGroup>
      <Priority>Low</Priority>
      <Market>NEM</Market>
   </Header>
   <Transactions>
      <Transaction transactionID="B2B-180319103024920-b28a8b8d92ce4d6c"
transactionDate="2019-03-18T10:30:24.920+10:00">
         <HubQueueReport version="r37">
            <ResultCount>2</ResultCount>
            <MessageDetails>
               <MessageMetaData>
                  <TransactionGroup>CATS</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Message</MessageType>

<MessageContextID>catsm_RECIPIENT_730393109</MessageContextID>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
               <MessageMetaData>
                  <TransactionGroup>NMID</TransactionGroup>
                  <Priority>Medium</Priority>
                  <FromParticipantID>NEMMCO</FromParticipantID>
                  <MessageID>939084340846-SOMW-4</MessageID>
                  <MessageType>Transaction Acknowledgement</MessageType>
```

```
<MessageContextID>catsl_RECIPIENT_730391291</MessageContextID>
                  <ReceivedDateTime>2019-02-20T15:37:50</ReceivedDateTime>
               </MessageMetaData>
            </MessageDetails>
         </HubQueueReport>
      </Transaction>
   </Transactions>
</ase:aseXML>
```

7.5.8 Participant Implementation

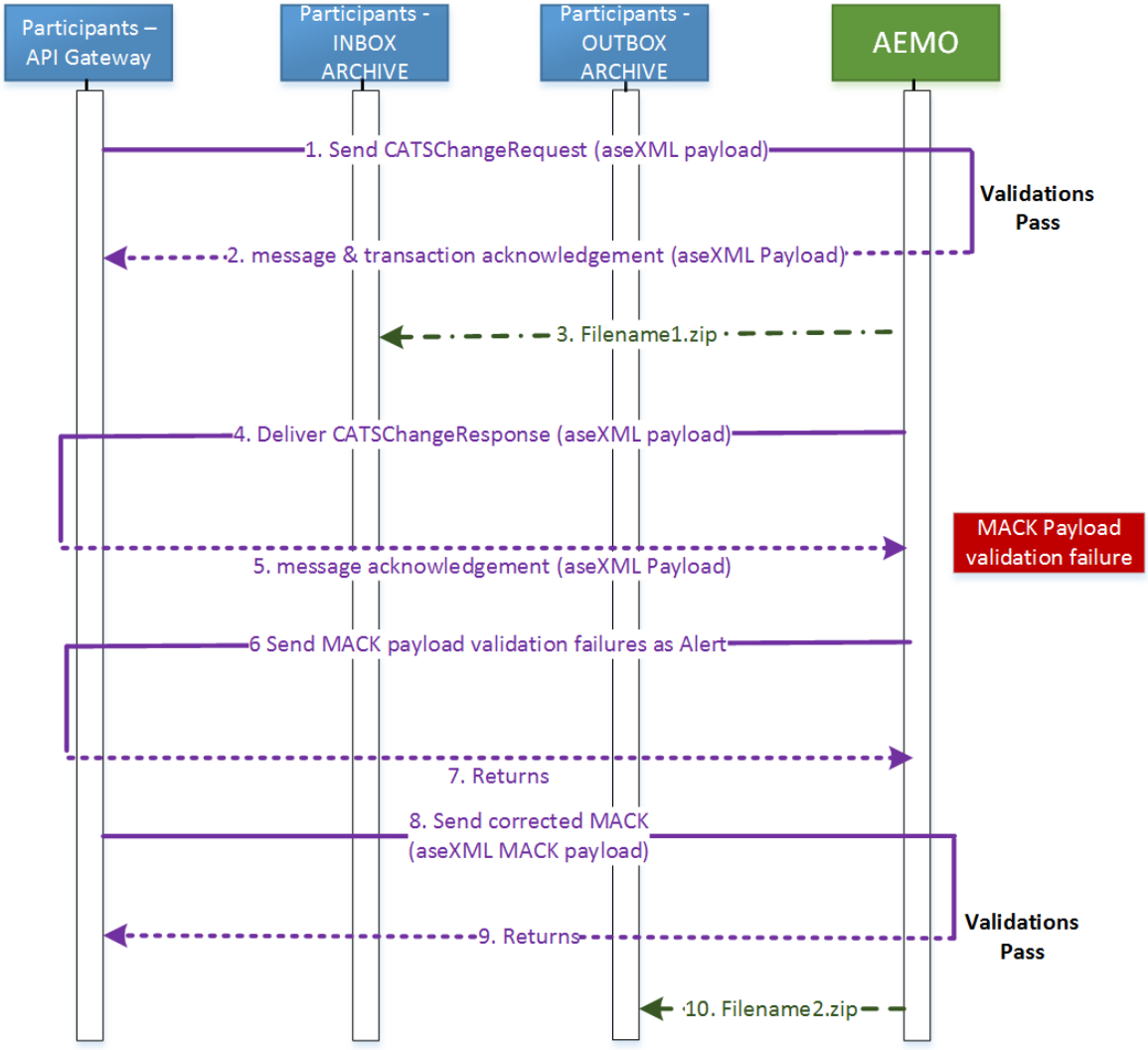
All API participants must implement an API which e-Hub would consume to send the requests via API. Participants can define their URL and the API name. The e-Hub only registers the API name of the participant. Participants are required to implement the following resources and methods on their APIs to accept the messages from the e-Hub.

Please note, this is an existing implementation for the B2B API participants.

Resource	Method	Description	Mandatory Header parameters
alerts	POST	Accept aseXML payload. Respond with a 200 OK. If the response code is not 200, the message will be delivered again	NA

7.6 API message acknowledgement validation

This diagram describes a scenario where the message acknowledgment was submitted using an API and the response payload sent by the participant fails validation. The validation failure is notified to the participant using an alerts API resource.



7.6.1 Validation process

Step	initiator	Process Step Definition	Recipient
1.	Participant	Same as steps 1—2 in Submission API Push > Receipt API Push~~Submission API Push > Receipt API Push~~ on page 56~~on page 54~~	AEMO
2.	AEMO	Sends a CATSChangeResponse to the New FRMP's B2M Outbox.	New FRMP

Step	initiator	Process Step Definition	Recipient
3.	New FRMP	Validates the message, accepts the payload, and creates a message acknowledgement as the response	AEMO
4.	AEMO	Identifies a validation failure and issues an API PayloadExceptionAlert	New FRMP
5.	New FRMP	Resends a valid message acknowledgement allowing archiving of the CATSChangeResponse in the B2M Outbox Archive Directory.	AEMO

~~7.7 Response codes~~

~~Problem~~	~~Code~~	~~Description~~	~~JSON payload example~~
~~Request processed successfully~~	~~200~~	~~OK~~	~~{ "transactionID": "xyz-123", "data": {.....} }~~
~~Invalid API URI~~	~~400~~	~~The service cannot be found for the endpoint reference (EPR) <URI>~~	~~<webM:exception xmlns:webM="http://www.webMethods.com/2001/10/soap/encoding"> <webM:className>org.apache.axis2.AxisFault</webM:className> <webM:message xml:lang="">The service cannot be found for the endpoint reference (EPR) /ws/GeneratorRecall1/1.0/listRecallPlans</webM:message> </webM:exception>~~
~~Malformed payload (JSON)~~	~~400~~	~~Bad request~~	~~No payload~~

Problem	Code	Description	JSON payload example

Invalid credentials	401	Unauthorized	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 401,
			"title": "Unauthorized",
			"detail": "Invalid UserName or Password",
			"source": null
			}
			]
			}

Expired user password	401	Unauthorized	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 401,
			"title": "Unauthorized",
			"detail": "Expired user password",
			"source": null
			}
			]
			}

No BASIC Auth information in HTTP Request Header	401	Unauthorized	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 401,
			"title": "Unauthorized",
			"detail": "Invalid UserName or Password",
			"source": null
			}
			]
			}

Problem	Code	Description	JSON payload example

Participant ID in the payload does not match to the Participant ID in the user name in the Basic Auth	401	Unauthorized	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 401,
			"title": "Unauthorized",
			"detail": "Invalid UserName or Password",
			"source": null
			}
			]
			}

Resource not found (URL resource)	404	Not found	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 404,
			"title": "Not Found",
			"detail": "Resources for the endpoint URI not found.
			Endpoint URI: <Resource>",
			"source": null
			}
			]
			}

Problem	Code	Description	JSON payload example

Invalid Method used (e.g. GET used instead of POST)	405	Method not allowed	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 405,
			"title": "Method Not Allowed",
			"detail": "Input request HTTP method is <Invalid Method passed>
			but operation <Resource Name>
			accepts only: [<Valid Method>]",
			"source": null
			}
			]
			}

Business validation failure	422	Unprocessable entity	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 73,
			"title": "InvalidBuySell",
			"detail": "BuySell value TEST is not valid",
			"source": null
			}
			]
			}

Problem	Code	Description	JSON payload example

Exceeds throttling limits	429	Too many requests	{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 429,
			"title": "Too Many Requests",
			"detail": "Number of inbound requests exceeded the throttling limits;
			try after sometime",
			"source": null
			}
			]
			}

The e-Hub is operational, but down-stream systems are not available	500	Application unavailable	Only when the control has reached the eHub Virtual API
			{
			"transactionID": "xyz-123",
			"data": {},
			"errors": [
			{
			"code": 500,
			"title": "Application Unavailable",
			"detail": "Application Unavailable",
			"source": null
			}
			]
			}

Problem	Code	Description	JSON payload example
The SSL Certificate is configured in the e-Hub but is not associated with a valid user	500	Internal server error	{ "transactionID": "xyz-123", "data": {}, "errors": [{ "code": 500, "title": "Internal Server Error", "detail": "Access Denied while executing operation:listRecallPlans service: GeneratorRecall at time:4:13:47 PM on date:Jun 27, 2018. The client ip was:10.20.6.22. The current user:Default. The consumer application:null", "source": null }] }
For any other validation failure, the e-Hub sends the HTTP response code 500	500	As per the validation failure	{ "transactionID": "xyz-123", "data": {}, "errors": [{ "code": 500, "title": "<As per the validation failure>", "detail": "<As per the validation failure>", "source": null }] }
Bad SSL Certificate	n/a	n/a	Error message of javax.net.ssl.SSLHandshakeException: Received fatal alert: bad_certificate

~~7.8~~7.7 Participant impact for APIs

1. Register with AEMO to use Push-Push APIs.

For help, see Guide to AEMO's e-Hub APIsf.

2. Participants having a valid AEMO e-Hub SSL certificate can already access the following Push-Pull APIs:
   a. API Flow Control Stop Notification.
   ~~b. API Request Participant Hub Queue details.~~
   ~~c. API message acknowledgement validation.~~
3. Set up your participant API Gateway.
4. Build the APIs needing implementation at the Participant API Gateway according to AEMO specifications.
5. Participant Administrators (PA) use the MSATS Web Portal to grant the required Participant User access to the User ID that will access the AEMO APIs.

7.8 FAQs

Question	B2MMessagingAsync, B2MMessagingPull and B2MMessagingSync	HubMessageManagement
Do I need an API Key to use AEMO's APIs?	No	Yes
Do I have to gain accreditation from AEMO before I can use APIs?	No	No
Do I need a certificate for each API?	No You can have 1 certificate for many APIs	No You can have 1 certificate for many APIs
Can I have 1 certificate for many Participant IDs?	Yes, The choice is yours, see see Guide to AEMO's e-Hub APIs, 'Decide how to use certificates'	Yes, The choice is yours, see see Guide to AEMO's e-Hub APIs, 'Decide how to use certificates'
Can I have 1 certificate for each Participant ID?	Yes, The choice is yours, see see Guide to AEMO's e-Hub APIs, 'Decide how to use certificates'	Yes, The choice is yours, see see Guide to AEMO's e-Hub APIs, 'Decide how to use certificates'

8. User Rights Access

This section explains the entities Participant Administrators (PA) use in the MSATS Web Portal to control Participant User access to the new functionalities.

For help with participant administration, see Guide to User Rights Management (URM).

8.1 APIs

Function	Entity
Retrieve Flow Control Status	Web Service Retrieve Flow Control Status
Retrieve Messages	Web Service retrieve messages
Retrieve Queue Meta Data	Web Service Retrieve Queue Meta Data
Submit Messages	Web Service Submit Messages
Submit Message Acknowledgements	Web Service Message Acknowledgements

8.2 B2M participant aseXML schema

Entity	Type
Participant aseXML Schema	Interactive

8.3 B2M Outbox protocol

Entity	Type
Participant Mailbox All	Interactive

8.4 MDM reports

Interface	Entity	Type
API	MDM Reports Batch	Batch
FTP to the Participant File Server	MDM Reports Batch	Batch
MSATS Web Portal > Reports and Alerts > MDM	MDM Reports	Interactive

8.5 Meter data enquiry

Entity	Type
Metering Data	Interactive
MDM Meter Data	Batch

8.6 Participant aseXML schema

Entity	Type
Participant aseXML Schema	Interactive

8.7 Participant hub queue

Entity	Type
Data Load Import (Participant Inbox & Participant Outbox)	Interactive

8.8 Queue monitoring

Entity	Type
Participant Queue Monitoring	Interactive

8.9 Participant system status

Entity	Type
Participant System Status	Interactive

8.10 Upload meter data

For access to upload B2M MTRD, B2B MTRD *metering data*, Participant Administrators (PA) use the following entities:

Interface	Entity	Type
API	MDM Meter Data	Batch
FTP to Participant File Server Inbox	MDM Meter Data	Batch
MSATS Web Portal > B2B Browser > Upload File	B2B Directory Inbox	Interactive

9. Implementation

9.1 Implications

To maintain systems in-line with AEMO's market systems, participants need to:

- Review and assess the impact on their market systems with respect to the changes implemented as part of this Release.
- Change their systems prior to the implementation of this Release.
- Schedule staff and resources to upgrade their market systems for the production implementation of this Release.

9.2 Risks

- No critical impacts to participants identified.

9.3 Upgrade options

From a technical perspective, the key is usually the aseXML release(s) each participant can support.

9.3.1 Option 1

- Update local processes and technical interfaces to suit the changes.

9.3.2 Option 2

- If changes are irrelevant to participant business processes and technical interfaces, ignore this release.
- Schedule staff and resources to upgrade their market systems from the implementation of this Release. To maintain systems in-line with AEMO's market systems, AEMO recommends upgrading within six months of the implementation date.
- Change their systems prior to the deployment of this Release to ensure they are current.
- AEMO encourages participants to make use of the four-week pre-production period, to assess and test any impact to their market systems and business processes.
  Participants using data replication products critical to their business are strongly advised to participate in the pre-production rollout and testing period.

10. References

10.1 Rules

National Electricity Amendment (Five-minute settlement rule) 2017 https://www.aemc.gov.au/rule-changes/five-minute-settlement.

National Electricity Rules: https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current.

10.2 AEMO's website

5MS Systems High-Level Impact Assessment: Provides a high-level assessment of the changes required to AEMO market-facing systems to support the 5-minute and global settlement rule changes.

aseXML Standards: Standard developed by Australian energy industries to facilitate the exchange of information between participants of the energy industries using XML. The aseXML Standards Working Group (ASWG) is responsible for the development and maintenance of the aseXML standard.

B2B Mapping to aseXML: Maps the Electricity B2B Business Documents and Signals to their aseXML Transactions and acknowledgements.

B2B Procedure: Meter Data Process: Published by AEMO in accordance with clause 7.17.3 of the NER and specifies the standard MDFF data request and Remote Service request processes.

B2B Procedure: Technical Delivery Specification: Specifies the technical requirements for the delivery of B2B Transactions using the *B2B e-Hub*.

Five Minute Settlement: Amendments to the Rules regarding 5-minute settlements.

Five-Minute Settlement: High Level Design: High-level design to support the AEMC draft determination.

Five-Minute Settlement and Global Settlement web page: Provides information, fact sheets, and work packages for the Five-Minute Settlement rule change.

Guide to AEMO's e-Hub APIs: Provides details about using aemo's e-hub as an Interface to communicate information with aemo. It assists electricity and gas participants developing their own APIs.

Guide to User Rights Management: Assists Participant Administrators (PA) to use the user rights management functions in the MSATS Web Portal.

Guide to Electricity Retail Market Procedures: Assists participants of the Retail Electricity Market to understand the overall framework. It also contains a list of terms used in the Retail Electricity Market Procedures and a full list of NEM procedures, guidelines, and documents.

Guide to MSATS and B2B Terms: Assists participants of the Retail National Electricity Market (NEM) to understand the terms used in the retail electricity market procedures and the Market Settlement and Transfer Solution (MSATS) participant IT system.

Guide to MSATS B2B: Provides information about the B2B e-Hub functions available in the Market Settlement and Transfer System (MSATS).

Guide to MSATS Web Portal**:** Assists retail energy participants to use the MSATS Web Portal functions.

Guide to Web Services: Explains AEMO's available web services and the parameters required to access them.

Hints and Tips – CATS & NMI Discovery: contains information about CATS transactions, common errors, rejections, reports, and answers to NMI Discovery Search issues.

Introduction to MSATS: An introduction to using the Market Settlement and Transfer Solutions (MSATS) web portal and batch interfaces.

LOAD PROFILES: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Metering/Load-Profiles

MDM File Format and Load Process: Documents the Meter Data Management (MDM) file load process. Published as part of the **Metering Package 2: Metering Data**: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Procedures-Workstream.

MDFF Specification NEM12 and NEM13: Specifies the Meter Data File Format (MDFF) used by MDPs for the provision of *metering data* to MDPs, ENMs, and *Registered Participants*.

MDP Data Delivery Calendar: Advises when MDPs deliver *metering data* to AEMO.

Meter Data File Format Specification Nem12 and Nem13 Consultation**:** Information about the final stage of consultation.

METERING PACKAGE 1: METERING DATA:
https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Procedures-Workstream/Metering-package-1---Metering-data

Metrology Procedures: Part A: minimum services specification procedures, emergency priority procedures, network device procedures, and meter churn procedures.

Metrology Procedures: Part B: Addresses the validation, substitution, and estimation of *metering data*.

MSATS Procedures: MDM Procedures: Details of processes performed by the MDM component of MSATS.

MSATS Procedures : CATS Procedure Principles and Obligations: Applicable to National Metering Identifier (*NMI*) small and large classifications.

MSATS Procedures - MDM Procedures: Documents the MSATS Procedures – MDM Procedures under clause 7.16.2 of the National Electricity Rule.

National Metering Identifier Procedure: Sets out the structure for National Metering Identifiers (NMIs) used in National Electricity Market (NEM), detailing *metering Data Streams* for each category of installation.

Service Level Procedure: Metering Data Providers: Details the service level obligation for Metering Data Providers.

B2B SMP Technical Guide: Provides the technical specifications for the delivery of B2B Transactions using the B2B e-Hub APIs.

11. Glossary

You can find other abbreviations and terms in the **Guide to MSATS and B2B Terms.**

Abbreviation/term	Explanation
5MS	Five-Minute Settlement
AEMO	Australian Energy Market Operator
AEMO API Gateway	The gateway on AEMO's side providing participant communication options, accessible over the internet or MarketNet. It uses resources and methods to push messages to Participants' API Gateways.
AEST	Australian Eastern Standard Time
API	Application Programming Interface. A set of clearly defined methods of communication between various software components.
API Web Portal	Where you can view available APIs, view and manage your API Keys, and obtain OAS files.
AseXML	A standard for energy transactions in XML. A set of schemas and usage guidelines that define how data is exchanged under FRC in the gas and electricity industries in Australia.
Asynchronous API	An API where the response to a submitted request is a message acknowledgement. For details see Guide to AEMO's e-Hub APIs.
B2B	Participant to participant
B2M	AEMO to participant
B2M Participant Inbox	Participant Inbox for B2M transactions on the Participant File Server.
B2M Participant Inbox	Participant Outbox for B2M transactions on the Participant File Server.
B2M Synchronous Web Services	AEMO's B2M RESTful Web Services. For details, see Guide to Web Services.
Batch Handlers	FTP exchange capabilities for the NEM Retail Electricity Market where participants submit data to AEMO's Participant File Server.
CATS	MSATS Consumer Administration and Transfer Solution. Manages customer transfers and site configuration changes in the NEM Retail Electricity Market.
CATS Standing Data	Data stored for each *NMI*.

Abbreviation/term	Explanation
Change Request	Transactions submitted to MSATS by participants when they want to create, or update data held within MSATS. Change Requests have numbers and are commonly referred to as CR [number].
Change Request Notification	A notification generated by MSATS and provided to one or more participants due to a change of status of a Change Request.
CND	CATS NMI Data
CNDS	CATS NMI Data Stream
CNPR	CATS NMI Participant Relationship
CR	Change Request
Data Stream	A measurement of energy on a *connection point*.
DLF	*Distribution loss factors*
e-Hub	Consists of AEMO's API Web Portal and AEMO's API Gateway.
Enterprise MDM	A new CATS MDM system implemented as part of the 5MS program. This system is not part of MSATS.
FCAS	frequency control ancillary services
Five-Minute Settlement (5MS)	Changes the settlement period for the electricity spot price from 30 minutes to five minutes, providing a better price signal for investment in fast response technologies, such as batteries, new generation gas peaker plants and demand response.
FRMP	Financially Responsible Market Participant
Global Settlement (GS)	An AEMC rule change for the demand side of the wholesale electricity market. Meaning, AEMO treats all retailers equally by allocating a share of UFE to all retailers in a distribution area, allowing them to fully reconcile the market.
GS	Global Settlements
HMTG	A Hub Management Transaction Group introduced to support message exchange between the e-Hub and participants related to the API protocol for example, participants requesting the e-Hub to send the list of current B2M stop files.
JSON	JavaScript Object Notation
LNSP	Local Network Service Provider

Abbreviation/term	Explanation
Lower Limit	The Upper Limit at the start of the day.
MACK	Message Acknowledgment. Participants receiving a message must ensure an ase:MessageAcknowledgement is generated for every aseXML Message received.
MarketNet	AEMO's private data network connection.
MDFF	Meter Data File Format offering a richer level of accumulation and interval meter data.
MDM	Meter Data Management The provider of Meter Data Management services for the NEM Retail Electricity Market.
MDMF	Meter Data Management file format used by MDPs to send *metering data* to AEMO for *settlements*. It has a singular purpose, allowing MDPs to deliver AEMO settlement ready *metering data* including any substitutions and forward estimations. Missing *metering data* is identified at the time of settlement when a Data Stream identified in the CATS Data Stream (CNDS) is not provided.
MDMT	B2M Meter Data Management Transaction Group
MDP	Meter Data Provider
MSATS	Market Settlement and Transfer Solution for retail electricity
MSATS Procedures	Incorporates the following procedures: CATS Procedures, WIGS Procedures, MDM Procedures, NMI Standing Data Schedule, NMI Procedure and Part A of the NEM ROLR Processes. For more details, see Guide to Electricity Retail Market Procedures.
MW	Megawatt
NEM	National Electricity Market
NER	National Electricity Rules
NMI	National Metering Identifier for electricity meters
NMI Discovery Search 1	The process of finding NMIs and their NMI Checksum by searching MSATS using the Site, the DPID or the Meter Serial ID. See also the NMI Search Rules in section 42.3.1 of the MSATS Procedures : CATS Procedure Principles and Obligations.

Abbreviation/term	Explanation
NMI Discovery Search 2	The process of entering a NMI and NMI Checksum in MSATS to obtain the *NMI Standing Data*. See also the *NMI Standing Data* Access Rules detailed in section 42.3.2 of the MSATS Procedures : CATS Procedure Principles and Obligations.
NMI Discovery Search 3	The search process used for only one of the purposes detailed in section 42.3.4 of the MSATS Procedures : CATS Procedure Principles and Obligations.
NMI Standing Data	A subset of the CATS Standing Data.
NMID	B2M NMI Discovery Transaction Group
OAS	OpenAPI Specification
Participant	A company or organisation with a Participant ID to sign into MSATS.
Participant API Gateway	The interface implemented by participants where AEMO's pushes API messages.
Participant File Server	The publishing point from AEMO systems to participant systems. Each participant is allocated an account and access to private and public areas. AEMO's production and pre-production environments are independently operated, so each environment has its own IP address. Participants are responsible for interfacing with the Participant File Server. If uncollected, files are moved to the archive folder after a couple of days and kept for approximately six months.
Participant Hub Queue	An MSATS-based queue of Participant Outbox messages.
Payload	The data sent by a POST request. The Payload sections sits after the header.
Procedures Working Group	A consultative forum to discuss the procedures impacts.
RDAT	Request for Participant Data. A request by MSATS to a participant for provision of the necessary data in a Change Request as defined in the MSATS Procedures : CATS Procedure Principles and Obligations.
Retail, Network, and other Market Participant activities	Use of *Metering Data* for purposes other than *Market Settlements*. Retail and Networking activities includes customer billing, network billing, networking settlements, and other *Market Participant* activities.
Role	The role a company or organisation has with a *connection point* in CATS. A single company or organisation can have more than one role associated with a *NMI*.
Shared Market Protocol	SMP defines a standard for communications between AEMO and participants for B2B communications.

Abbreviation/term	Explanation
SMP	Shared Market Protocol
Software Working Group	A consultative forum to discuss technical impacts.
Stop File	Created when the number of files within a queue exceeds the upper or lower limit. Once imposed no more processing on inbound transactions can occur until the number of files falls below the lower limit. Where a participant belongs to a group, the limits apply to the group not to the individual.
Supply Point	A transmission, distribution, or consumer's supply point.
TACK	Transaction Acknowledgment. Participants receiving a transaction must ensure an ase:TransactionAcknowledgement is generated for every Business Document that passed validations associated with generating an ase:MessageAcknowledgement. For details, see B2B Mapping to aseXML.
TNI	Transmission Node Identifier
Transaction Group	A procedure grouping similar B2B or B2M transactions.
Transaction Protocol	API or FTP
TUOS	Transmission Use of System Charge. Recovers the cost of installing and maintaining the transmission system for the NEM. AEMO is required by NER (Chapter 6A) to calculate TUOS prices and charges by 15 May each year.
UFE	Unaccounted for Energy
UOM	Unit of measure data
Upper Limit	The Upper Limit may increase near the end of the day due to Change Request limits relaxing.
XML	Extensible Markup Language

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Appendix 2 - MDM Missing and Mismatched Reads Report Scenarios

Scenario 1a: Successful load

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active N1 Data Stream
Stored reads	The MTRD transaction is stored containing reads for E1 and B1 each with a MDMDataStreamIdentifier of N1

Stored Read				
CSV format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	B1	N1	E1B1	15-Aug-2020 13:20:57
MDFF	E1	N1	E1B1	15-Aug-2020 13:20:57

RM11/37 output	No missing reads reported for the settlement date 2020/07/13 as the N1 has readings to satisfy settlements
RM38 output	No missing Data Streams identified
RM39	No mismatched reads identified

Scenario 1b: Successful load

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active E1 and B1 Data Streams
Stored reads	The MTRD transaction is stored containing reads for E1 and B1 each with a MDMDataStreamIdentifier of N1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	B1	N1	E1B1	15-Aug-2020 13:20:57
MDFF	E1	N1	E1B1	15-Aug-2020 13:20:57

RM11/37 Output	No missing reads reported for the settlement date 2020/07/13 as the readings are available for E1 and B1 NMI Suffixes Note: N1 is not required in the MDMDataStreamIdentifier field for this scenario.
RM38 Output	No missing Data Streams identified
RM39	No mismatched reads identified

Scenario 2a: Missing Data and Mismatched Reads

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active N1 Data Stream
Stored reads	The MTRD transaction is stored containing reads for E1 and B1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	B1		E1B1	15-Aug-2020 13:20:57
MDFF	E1		E1B1	15-Aug-2020 13:20:57

RM11/37 output MDP,SettlementDate,NMI,Suffix,SeqNo MDP123,2020/07/13,XXXX006316,N1,1	No reads received to support the N1 Data Stream, therefore the N1 Data Stream is reported as missing
RM38 output	No Missing Data Streams identified
RM39 MDP,SettlementDate,NMI,MeterSerialNumber,Suffix,SeqNo MDP123,2020/07/13,XXXX006316,METER123,B1,1 MDP123,2020/07/13,XXXX006316,METER123,E1,2	Reads for B1 and E1 Data Streams received and not assigned to a NMI Data Stream, so both registers are reported as mismatched

Scenario 2b: Missing Data

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active E1, B1, Q1, K1 Data Stream
Stored reads	The MTRD transaction is stored containing reads for E1 and B1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	B1		E1B1Q1K1	15-Aug-2020 13:20:57
MDFF	E1		E1B1Q1K1	15-Aug-2020 13:20:57

RM11/37 output MDP,SettlementDate,NMI,Suffix,SeqNo MDP123,2020/07/13,XXXX006316,Q1,1 MDP123,2020/07/13,XXXX006316,K1,1	No missing reads received for the Q1 and K1 Data Streams, so the Q1 and K1 Data Streams are reported as missing Note: Q1 and K1 will not impact settlement calculations as the E1 and B1 Data Streams satisfy settlements. However, Q1 and K1 missing data reflects on the data quantity and quality reports
RM38 output	No missing Data Streams identified
RM39	No mismatched reads identified

Scenario 3a: Data Stream Missing Data

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active N1 Data Stream
Stored reads	The MTRD transaction stored reads with an MDMDataStreamIdentifier of N1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	E1	N1	E1B1	15-Aug-2020 13:20:57

RM11/37 output	No missing reads reported for the settlement date 2020/07/13 as the N1 readings satisfy settlements
RM38 output MDP,SettlementDate,NMI,Suffix,SeqNo MDP123,2020/07/13,XXXX006316,B1,1	NMIConfiguration contains the E1 and B1 suffix, no reads for B1, so the B1 is reported as missing
RM39	No mismatched reads identified

Scenario 3b: Data Stream Missing Data

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active N1 and N2 Data Streams
Stored reads	The MTRD transaction is stored containing reads for E1 and B1 each with a MDMDataStreamIdentifier of N1
E2 with an MDMDataStreamIdentifier of N2	

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	E1	N1	E1B1E2B2	15-Aug-2020 13:20:57
MDFF	B1	N1	E1B1E2B2	15-Aug-2020 13:20:57
MDFF	E2	N2	E1B1E2B2	15-Aug-2020 13:20:57

RM11/37 output	No missing reads reported for the settlement date 2020/07/13
RM38 output MDP123,2020/07/13,XXXX006316,B2,1	NMIConfiguration contains the E1, B1, E2, and B2 suffix, no reads received for B2, so the B2 is reported as missing
RM39	No mismatched reads identified

Scenario 3c: Data Stream Missing Data

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	Active N1 Data Streams

Stored reads	The MTRD transaction is stored containing reads for E1 and B1 each with an MDMDataStreamIdentifier of N1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP version date**
MDFF	E1	N1	E1B1E2B2	15-Aug-2020 13:20:57
MDFF	B1	N1	E1B1E2B2	15-Aug-2020 13:20:57

RM11/37 output	No missing reads reported for the settlement date 2020/07/13			
RM38 Output NMIConfiguration contains the E1	B1	E2 and B2 suffix	No reads received for E2 and B2	
MDP123	2020/07/13	XXXX006316	E2	1
MDP123	2020/07/13	XXXX006316	B2	2
RM39	No mismatched reads identified			

Scenario 4: Mismatched Reads

NMI	XXXX006316
MDP	MDP123
Settlement data	2020/07/13
Standing data (CNDS)	no data
Stored reads	The MTRD transaction is stored containing reads for E1 and B1, each with an MDMDataStreamIdentifier of N1

Stored Read				
csv format	**NMISuffix**	**MDMDataStreamIdentifier**	**NMIConfiguration**	**MDP Version Date**
MDFF	E1	N1	E1B1E2B2	15-Aug-2020 13:20:57
MDFF	B1	N1	E1B1E2B2	15-Aug-2020 13:20:57

RM11/37 output	No missing reads reported for the settlement date 2020/07/13
RM38 output	No missing Data Streams identified
RM39 MDP,SettlementDate,NMI,MeterSerialNumber,Suffix,SeqNo MDP123,2020/07/13,XXXX006316,METER123,B1,1 MDP123,2020/07/13,XXXX006316,METER123,E1,2	Reads for B1 and E1 Data Streams received and not assigned to a NMI Data Stream, so both registers are reported as mismatched