AEMO 5MS/GS CNDS & Meter Data Delivery Clarifications

Version 1.1

Content accurate as at 31 July 2020

Table of contents

Purpose

Audience

This document is primarily intended for Metering Data Providers (MDPs) affected by the Five-minute settlement (5MS) and Global settlement (GS) market reforms.

It assumes the reader has a good level of knowledge about NEM metering data systems and processes.

For more information see:

https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/market-operations/retail-and-metering/market-settlement-and-transfer-solutions-msats

Purpose

The purpose of this document is to provide additional context and clarification regarding the maintenance and population of the CATS_ NMI_ DATA_STREAM ('CNDS') table. These clarifications are intended to support the appropriate completion of required transitional and operational activities leading up to the 5MS Rule commencement.

This document also seeks to clarify MDP B2M data delivery concepts relating to the implementation of AEMO's new Meter Data Management (MDM) platform.

Out of scope
Please note: This document **does not** consider updates to the other CATS Master tables:
- CATS_NMI_DATA
- CATS_METER_REGISTER
- CATS_REGISTER_IDENTIFIER
- CATS_NMI_PARTICIPANT_RELATIONS

Background

Five-minute settlement (5MS) & Global Settlements Rules (2017 – 2019)

Five-minute settlement

On 28 November 2017 the AEMC made a final rule to align operational dispatch and financial settlement at five minutes, starting 1 July 2021. This will reduce the time interval for financial settlement in the National Electricity Market (NEM) from 30 minutes to five minutes.

https://www.aemc.gov.au/rule-changes/five-minute-settlement

Global settlement

On 6 December 2018, the AEMC made a final rule to introduce a 'global settlement' framework for settlement of the demand side of the wholesale electricity market, commencing 6 February 2022. A 'soft start' is also required where unaccounted for energy will be published by AEMO from 1 July 2021.

https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation

Five minute settlement and global settlement implementation amendments

On 8 August 2019, the AEMC made a final rule to amend nine areas of the National Electricity Rules to help implement five minute settlement and global settlement. It improves wholesale market operations under 5MS, clarifies GS arrangements and improves information provision requirements.

https://www.aemc.gov.au/rule-changes/five-minute-settlement-and-global-settlement-implementation-amendments

April 2020 - Proposed changes to 5MS and GS (1/2)

Prioritising implementation timeframes for rule changes: ESB letters to the Federal Energy Minister

On 7 April 2020 the Energy Security Board (ESB – comprising AEMO, AEMC and AER) wrote to the Federal Energy Minister to advise that it was "prioritising implementation timeframes for rule changes" in light of the Covid-19 impacts. In relation to 5MS, it proposed:

- Industry be provided with a 12 month delay to five-minute settlement implementation
- The AEMO program will progress internally as planned
- AEMO will prepare a rule change required to give effect to this change and submit to the AEMC

https://www.aemc.gov.au/sites/default/files/2020-04/Letter%20from%20AEMC%20AER%20AEMO%20-%20Prioritising%20implementation%20timeframes%20for%20rule%20changes%20-%207%20April%202020.pdf

On 9 April 2020, a second letter was sent by the ESB to the Federal Minister providing a 'more detailed view' of the regulatory work plan subject to future stakeholder consultation. It reiterated the proposed delay to both 5MS and GS and that AEMO had submitted a rule change seeking a 12-month delay.

https://www.aemc.gov.au/sites/default/files/2020-04/Letter%20from%20AEMC%20AER%20AEMO%20-%20Prioritising%20implementation%20timeframes_a%20more%20detailed%20view%20-%209%20April%202020.pdf

April 2020 - Proposed changes to 5MS and GS (2/2)

Rule change proposal: Delayed implementation of five minute and global settlement

On 9 April 2020, AEMO submitted a rule change request to the AEMC proposing:

- 5MS and the GS 'soft start' commencements deferred to 1 July 2022
- GS commencement deferred to 5 February 2023
- No change to the 5-min metering data delivery date of 1 December 2022 for new and replacement type 4 and type 4A meters
- A transitional rule to allow AEMO to change the effective date of already-determined procedures (updated for 5MS and GS) without further consultation.

https://www.aemc.gov.au/rule-changes/delayed-implementation-five-minute-and-global-settlement

AEMC Final Determination re proposed changes to 5MS and GS

- The AEMC determined that a three month delay to the commencement of 5MS and GS was in the long term interests of consumers because it balanced the capability constraints of the industry against the increasing costs of delayed implementation.
- The AEMC explored options of three, six, and 12 month delays, and considered that a three month delay would address industry capability concerns, without significantly increasing implementation costs or deferring the benefits of the 5MS and GS rules.
- New dates:
    - 1 Oct 2021 - Commencement of 5MS
    - 1 Oct 2021 - Commencement of "soft start" GS
    - 1 May 2022 - Commencement of financial settlement of GS
- The compliance date remained the same (1 Dec 2022) for all new and replacement metering installations (other than excluded metering installations) to be configured to record and provide 5-minute metering data

https://www.aemc.gov.au/sites/default/files/documents/final_determination.pdf

Implementing the 5MS Rule

The 5MS Rule requires the collection, storage and delivery of revenue metering data in five-minute trading intervals for use in energy settlement, network and retail billing.

From a metering installation and metering data provision perspective, the rule requires:

- Types 1, 2 and 3 metering installations to record, store and deliver five-minute metering data from the rule commencement date, as well as Type 4 meters at all transmission connection points and distribution connection points where the relevant financially responsible Market Participant (FRMP) is a Market Generator or Small Generation Aggregator.
- All new and replacement metering installations, other than type 4A, installed from 1 December 2018 to provide five-minute metering data from 1 December 2022 at the latest.
- All new and replacement type 4A metering installations installed from 1 December 2019 to provide five-minute metering data from 1 December 2022 at the latest.
- Type 7 unmetered loads to be calculated on a five-minute basis from the 5MS Rule commencement date.

For those installed types 4 and 4A, 5 and 6 meters that do not need to provide five-minute metering data from the 5MS Rule commencement date, AEMO will using the profile methods described in section 12 of Metrology Procedure Part B.

Background: the CNDS table

The CATS_NMI_DATA_STREAM (CNDS) table is:

- A CATS master table containing data that is stored at a NMI Datastream level. Information stored in the CNDS table includes DataStream Suffixes, DataStream Type codes, Profile Name, Average Daily Load, etc.
- Updated whenever a CATS Change Request containing inbound CATS Data Stream information achieves a status of "Completed".

Market participants, which have a relationship to a specific NMI, have access to applicable CNDS records. This information is used by Participants to support core functions such as Retail and Network billing. MDPs have various obligations in ensuring the ongoing accuracy of this information. **If the CNDS table is not accurately populated in a timely manner, the integrity of Participant functions and of AEMO's NEM Market Settlement processes could be compromised.**
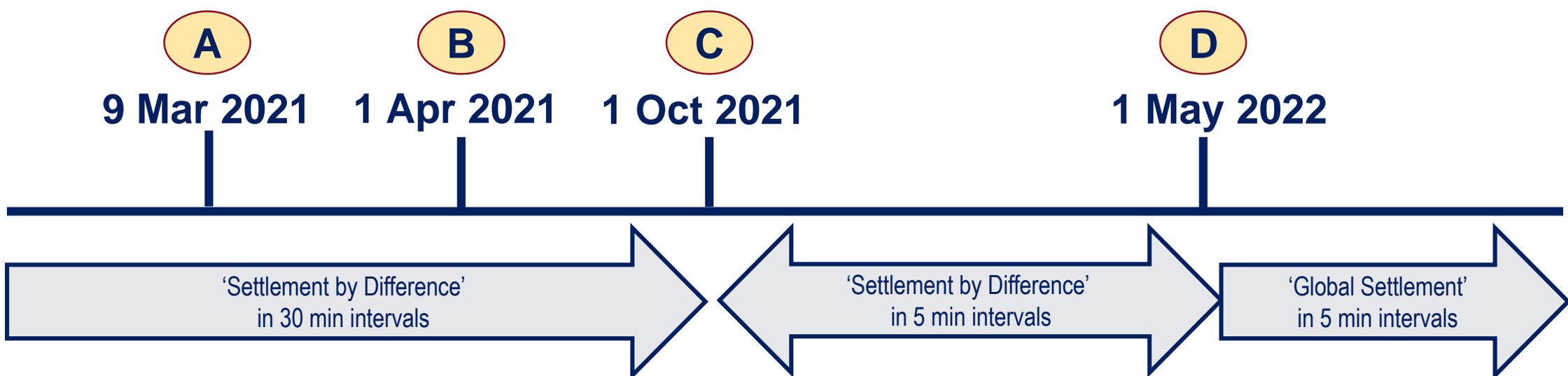
The CNDS table, and specifically CNDS records, are critical for AEMO to accurately:

- Perform NEM Market Settlement processes
- Perform UFE calculations
- Perform VIC TUoS billing
- Generate MDP Quality and Quantity reports

With the introduction of Global Settlements, _all_ NMIs (including first and second tier) will be used for NEM market settlement purposes for the first time. As part of its 5MS program, AEMO is introducing improved system reporting and validations to better monitor the quality of the CNDS table. Some of these improvements will be discussed in more detail in this document.

Relevant Metering Dates

Due to the 5MS and GS Rules, AEMO is implementing material and pervasive changes to business processes and systems. These changes will be introduced on various dates over the coming 3 years to enable an appropriate transition to the Rules' requirements i.e. a staged transition rather than a 'big bang' start.

A	B	C	D
9 Mar 2021	1 Apr 2021	1 Oct 2021	1 May 2022

'Settlement by Difference' in 30 min intervals → 'Settlement by Difference' in 5 min intervals → 'Global Settlement' in 5 min intervals

Ref.	Go-Live/Rule Commencement	Indicative Date
A	New AEMO MDM Go-Live (30-min MDFF)	9 Mar 2021
B	5 and 15-min MDFF Go-Live	1 Apr 2021
C	5MS Rule & UFE Publication Commencement (GS 'soft start')	1 Oct 2021
D	Global Settlement Financial Commencement	1 May 2022

AEMO staged transition: Description of key dates

Ref.	Go-Live or Rule Commencement	Description
A	New AEMO MDM Go-Live (30-min MDFF)	• MSATS system restructured to allow the new MDM and the existing CATS to operate as independent applications with some critical changes: • CATS: • Introduction of new/updated codes for: NMI Classifications, DataStreamTypes, Meter InstallationTypes, ReadTypes and DataStreamSuffix validations • New MDM: • Supports 30-min metering data for the purposes of NEM Settlement calculations, Profiling, UFE Calculations and Vic TUos billing • Will accept MDMF/MDMT transactions (Net data in 30 minute trading intervals and Accumulation data) • Will continue to generate the current RM reports as well as the new RM reports (as per MDM Procedures Appendix 9)
B	5 and 15-min MDFF Go-Live	• The new MDM will be: • Able to receive and process MDFF NEM12 (5, 15 or 30 minute interval metering data) & NEM13 files • Able to continue to receive and process MDMF files (Net interval data aggregated to 30 minutes and accumulation metering data) • Able to aggregate 5 and 15-min interval metering data to 30-min trading intervals to support 30-min NEM Settlements up until 5MS commencement
C	5MS go-live and GS "soft start"	• AEMO will be able to: • Receive and process MDFF NEM12 (5, 15 or 30 minute interval metering data) & NEM13 files • Receive and process MDMF files (Net interval metering data aggregated to 30 minutes relating to pre-5MS Commencement date periods and accumulation metering data) • Profile 15 and 30-min and accumulation metering data into 5-min trading intervals to support 5-min NEM Settlements • Calculate UFE volumes and publish them on NEM Settlement Invoices (with no dollar amount and no financial settlement impact)
D	GS Financial Commencement	• AEMO will: • Settle the market via GS arrangements • E.g. UFE volumes are now actively settled through NEM Settlements (GS 'financial go-live')

Key CNDS Procedural references

The following tables provides key AEMO procedural references relating to the updating and ongoing maintenance of the CATS CNDS table.

Note: This is not an exhaustive list of all CNDS procedural references.

Procedure details	Procedure extract
Metrology Procedures Part A, 6/2/22, 7.1, Section 3.12.4	(a) Each MDP must deliver to AEMO all Datastreams related to settlements ready data and any other metering data configured in the metering installation to support UFE calculations for all connection points the MDP is responsible for, by the dates and for the periods, specified in the Data Delivery Calendar.
NMI Procedures, 1/7/21, 7.0, Section 7	Table 1 Datastream Suffixes for Interval Metering Data & Table 2 Datastream Suffixes for Accumulated Metering Data
MSATS CATS Procedures, 6/2/22, 5.0, Section 2.4	(f) Create or update the datastream within two business days from the time the meter is installed/removed/reconfigured or as required when the MDP becomes the Current MDP. (j) Register individual Datastreams in MSATS as described in the NMI Procedure
MSATS CATS Procedures, 6/2/22, 5.0, Section 4.13.1	(a) If the Metering Installation Type Code is COMMSx, MRIM, MRAM, VICAMI, NCONUML or UMCP: (iii) Datastream Suffix must be at a register level (e.g. E1, B1, Q1, K1)
MSATS CATS Procedures, 6/2/22, 5.0, Section 4.12.2	(a) In the MDM process, the Datastream Status Code is used in combination with the DataStreamType to determine whether a Datastream suffix is to be used in the settlements process or where any other metering data has been configured to support the calculation of Unaccounted for Energy (UFE). (c) The Datastream Type Codes in MSATS are 'I', 'C', 'P' and 'N', as defined in NMI Standing Data for MSATS document (Table 12)

SLP: MDP, 1/7/21, 2.0, Section 2.4.1	(a) Each MDP - Category D must:
	(v) for Datastream Suffix(s) corresponding to interval metered connection points, update the Datastream Suffix value from 'N' to Register level (E1,B1) when:
	    (A) a new metering installation is installed at a connection point; or
	    (B) a configuration within an existing meter or metering equipment is updated

SLP: MDP, 1/7/21, 2.0, Section 3.12.4	(a) Each MDP must deliver to AEMO all Datastreams related to settlements ready data and any other metering data configured in the metering installation to support UFE calculations for all connection points the MDP is responsible for, by the dates and for the periods, specified in the Data Delivery Calendar.
Standing Data for MSATS, 6/2/22, 5.0	Table 25 Valid Datastream Type Codes

Potential CNDS Procedural Updates

AEMO acknowledges that the Electricity Retail Consultative Forum ('ERCF') is currently assessing the location of the ADL within the CATS database. Assuming that the ADL remains within the CNDS table, AEMO proposes to include reference to a wider review of the ADL such as:

- Within MDP SLP & Standing data for MSATS, review specifying an ADL value of '1' for DataStreamSuffix's = 'X', 'J', 'K', 'L', 'P', 'Q', 'R', 'S', 'T', 'U', 'G', 'H', 'Y', 'M', 'W', 'V' & 'Z'
- Within Metrology Procedures Part B, review specifying ADL as a substitution method to be utilised as a 'last resort' and should only be used for kWh related CNDS records.

At a future point in time, AEMO will consult with industry on the following CNDS clarifications:

- MDFF Specification - review the Register Level CNDS record examples in Appendix H

- Metrology Procedures Part B, review:
    - Order of substitution method application across all meter types
    - All direct or implied references to an ADL substitution methods
    - Substitution method for Generators (with consideration of ADL)
    - Validation and substitution of kVArh data

- CATS Procedures, MDM Procedures and NMI Procedures - inclusion of a 'Net' CNDS record 'sunset' clause

CNDS Records

What are CNDS records?

- CNDS records are created/updated by the CATS system following the successful completion of a change request (CR).

- Data in the CNDS table includes: DataStreamSuffix, DataStreamType, Profile Name and Average Daily Load

- CNDS records can be generally referred to as:

Datastream	Example
Net datastream records	**DataStreamSuffix = 'N1'**
Register Level Interval datastream records	**DataStreamSuffix = 'E1'**
Register Level Accumulation datastream records	**DataStreamSuffix = '11'**

What's changing under 5MS?

MDPs are required to transition Net CNDS datastream records, in certain situations e.g. for type 1-3 and subset of 4 meters prior to the 5MS commencement date, to Register Level Interval datastream records. The timings and approach of this transition is being managed by the 5MS Readiness Working Group (RWG) via the Metering Transition Plan and reflects the 'end state' requirements of the relevant metering procedures.

AEMO requests that all datastreams connected to a NMI are all converted to Register level at the same time. This results in all metering data associated to a particular NMI being provided to AEMO via MDFF. This approach avoids metering data being delivery to AEMO via a mixture of MDMF and MDFF for the same NMI.

Net CNDS Records

Current Service Level Procedure: MDP Services requirement (3.7.1):

- (e) aggregate interval metering data for a connection point into a 30-minute interval net Datastream prior to delivery to AEMO as required by the MSATS Procedures, MDM Procedures and NMI Procedures;

New 5MS Service Level Procedure: MDP Services requirement (2.4.1):

- (v) for Datastream Suffix(s) corresponding to interval metered connection points, update the Datastream Suffix value from 'N' to Register level (E1,B1) when:
    - (A) a new metering installation is installed at a connection point; or
    - (B) a configuration within an existing meter or metering equipment is updated.

For the avoidance of doubt:

- Active Net CNDS records will still exist in some instances post 5MS commencement
    - AEMO will be consulting with industry at some point in the future on the introduction of a 'Net' CNDS record 'sunset' clause
- When creating Register Level Interval CNDS records, all of the Net CNDS records must have a deactivation date equal to the effective date of the associated Register Level CNDS records
- An MDP must send AEMO meter data where a NET CNDS record is active (regardless of the NMI status)
- Net CNDS records must not be created from the 5MS commencement with an effective date equal to or greater than the 5MS commencement date

Interval Register Level CNDS Records

In accordance with the new 5MS Service Level Procedure: MDP, the following CNDS records must be created (to match the capabilities of the meter) and maintained accurately in a timely manner where required to support the following critical processes.

AEMO Process	Mandatory CNDS Records (as per NMI Procedures)
NEM Settlements	DatastreamSuffix = 'E' & 'B' or 'A' & 'D'
UFE Analysis	DatastreamSuffix = 'Q' & 'K' or 'P' & 'J'
VIC TUoS: NEM Settlements	DatastreamSuffix = 'E' & 'B' or 'A' & 'D'
VIC TUoS: UFE analysis	DatastreamSuffix = 'Q' & 'K' or 'P' & 'J'
VIC TUoS: Billing	DatastreamSuffix = 'E', 'B', 'Q' & 'K' or 'F', 'C', 'L' & 'R' or 'A', 'D', 'P' & 'J'

For the avoidance of doubt:

- A Register Level Interval CNDS record must not be replaced by a Net CNDS record
- Register Level Interval CNDS records must reflect a DatastreamType code of 'I', 'P' or 'N'
  - Refer to Section 'CNDS DataStreamType Codes' for further details
- Once a Register Level Interval CNDS record has been created, an MDP must send AEMO meter data in MDFF from its effective date
  - Refer Section 'CNDS & Meter Data Delivery' for further details
- AEMO's preference is for MDPs to transition Net records to Interval Register level CNDS records as soon as possible from the date AEMO introduces its MDFF capability

Accumulation Register Level CNDS Records

CNDS records associated to accumulation/basic meters are currently created and maintained at the register level. This requirement continues in a 5MS/GS environment.

AEMO CNDS Record Purpose	Mandatory CNDS Records (as per NMI Procedures)
NEM Settlements	**1st character of the DatastreamSuffix = '1', '2', '3', '4', '5', '6', '7', '8', '9'**

For the avoidance of doubt:

- Non-NEM Settlements CNDS records e.g. Demand related Accumulation Registers may exist in the CNDS table but the ElectricityDataStream/Status must be 'I' (Inactive)

- NEM Settlement CNDS records must reflect a DatastreamType of 'C'
    - Refer to Section 'CNDS DataStreamType Codes' for further details

- In order for AEMO to allocate all 'known' load for UFE calculation purposes, including 1st tier accumulation metering data and NCONUML metering data, an MDP must:
    - Create and/or activate all accumulation CNDS records in MSATS at least 3 months before the GS "soft start" commencement date
        - For active NMIs (NMI Status = A) with an accumulation metering installation, there must be at least one active CNDS record with a DatastreamType of 'C'
    - Commence delivery of metering data and forward estimates for manually read and NCONUML metering installations no later than 3 months before the 5MS commencement date

CNDS DataStreamType Codes

DataStreamTypes in CNDS records

- The 'DataStreamType' is a mandatory field for all records within the CNDS table
- As part of the 5MS procedure consultations, DataStreamType codes where updated by:
  - Removing type codes '1', '2', '3' & '4' (currently used for Vic TUoS Billing purposes)
  - Adding type code 'N', used where the Interval Datastream is not to be included in the NEM Settlement process or NEM Profile calculations
  - Maintaining type codes:
    - 'I' used where the Interval Datastream is included in NEM Settlement processes
    - 'P' used where a Profile Datastream is included in NEM Profile calculations (Sample meters only)
    - 'C' used where Consumption Datastream is included in NEM Settlement Processes
- The functionality supporting these updates will be implemented as part of AEMO's new MDM platform
- The RWG has responsibility for ensuring that the appropriate transition to these codes occurs
- Refer to Appendix A: Scenarios - Net & Register level CNDS records for further details.

DataStreamSuffix and DataStreamType 'Combination' validations

- 'Combination' validations will be limited due to complexities associated to physical metering installations and the sequential processing of CNDS records by the CATS system.

- An example of these complexities is:
  - Metering Installation type 1 or type 2 metering
    - Where records are created in separate CRs for DataStreamSuffix 'A', 'D', 'E' and 'B'
      - And where all 4 DataStreamSuffix have a DatastreamType code of 'I'

- Proposed system validations would not be able to identify that 2 valid 'sets' of datastream suffixes (A&D or B&E) have been created with a DatastreamType code of 'I'. In these instances, MDPs will be responsible for ensuring that should these datastream suffixes need to be created, that only one 'set' has a DatastreamType of 'I' at any point in time.

- Within the "StandingDataQualityReport" (RM29) reporting, AEMO will identify unexpected combinations across all active CNDS records for a NMI.

- Refer to 'Appendix A: Scenarios - Net & Register level CNDS records' which provide further details regarding these 'combination' scenarios.

Valid 5MS DataStreamSuffix and DataStreamType Code 'Combinations'

- The tables below provide the valid 'combinations' between DataStreamType codes and the first character of the 'ElectricityDataStream/Suffix' value.
- With consideration to the physical configuration of an individual meter and/or *Metering Installation*, DataStreamSuffixes highlighted in GREEN reflect AEMO's allowable combinations from the AEMO MDFF Go-Live **and not prior to this date.**

Net & Register Interval CNDS Records

	First character								2nd character
	Ave	*DatastreamType*	Master	*DatastreamType*	Check	*DatastreamType*	Net	*Datastream Type*	
IMPORT kWh	A	*I or N for Virtual NMI's*	B	*I or N for Virtual NMI's*	C	*N*	N	*I or P*	Meter numbers or measuring elements are to be 1-9 then A-H, J-N, P-Z
EXPORT kWh	D	*I or N for Virtual NMI*	E	*I, P or N for Virtual NMI's*	F	*N*			
IMPORT kvarh	J	*N*	K	*N*	L	*N*	X	*N*	
EXPORT kvarh	P	*N*	Q	*N*	R	*N*			
KVAh	S	*N*	T	*N*	U	*N*			
Power Factor pF			G	*N*					
Q Metering Qh			H	*N*	Y	*N*			
Par Metering parh			M	*N*	W	*N*			
VOLTS (or V²h) or Amps (A²h)			V	*N*	Z	*N*			

Accumulation Register Level CNDS Records

First Character		Second Character	Datastream Type
1	First Datastream	Meter numbers are to be 1-9 then A-H, J-N, P-Z.	*C*
2	Second Datastream		
3	Third Datastream		
4	First controlled load Datastream		
5	Second controlled load Datastream		
6	Third controlled load Datastream		
7	First LNSP/ENM defined Datastream		
8	Second LNSP/ENM defined Datastream		
9	Third LNSP/ENM defined Datastream		

ADL in CNDS

ADL in CNDS

- The 'AverageDailyLoad' ('ADL') is a mandatory field in the CNDS table and is currently associated to all NET kWh CNDS records.

- Where any active data stream in CATS has no metering data for a trading day, AEMO will substitute using the ADL to allow the NEM Settlement process to continue.

- In order to calculate an ADL for a NMI, across all active data streams regardless of the number of meters, registers or data streams, **the summation of all kWh based ADL values shall result in the Total ADL for the NMI.**

    - Note, this summation only applies to records where the datastream type is either 'I', 'P' or 'C'

- The Current MDP must:

    - Obtain the ADL from the FRMP or the LNSP and update the ADL in MSATS if it is missing or incorrect.

    - Consider and action as necessary within two business days any updated ADL information provided by the LNSP or Current FRMP.

    - Recalculate the ADL for **each active Datastream** at least annually and enter this value in MSATS where the calculated value differs by more than 20% from the ADL recorded in MSATS. Where the current ADL is under 5kWh and the newly calculated ADL is found to be still less than 5kWh there is no requirement for the MDP to update the ADL record within MSATS.

        - Note, this recalculation only applies to records where the datastream type is either 'I', 'P' or 'C'

CNDS & Meter Data Delivery

AEMO's New MDM Platform

From the introduction of AEMO's new MDM platform, AEMO will be able to:

- Accept and process:
  - Register level 5, 15 and 30-min *interval* metering data in MDFF (NEM12)
  - Net 30-min *interval* metering data in MDMF for pre-5MS commencement date reads
  - Accumulation/basic meter reads in both MDMF and MDFF (NEM13)
- Support NEM Settlements regardless of:
  - The applicable market settlement arrangements i.e. 'Settlement by Difference' (30 or 5-min) and Global Settlements
    - This includes the aggregation of sub 30-min metering data pre-5MS commencement and/or profiling of 15 or 30-min and accumulation metering data to support all arrangements
  - The type of CNDS records i.e. Net or Register level
  - The granularity of metering data being delivered by MDPs e.g. 5, 15 or 30-min

CNDS & Meter Data Delivery Matrix

From the AEMO MDFF Go-Live, AEMO will manage CNDS, MDFF and MDMF combinations as per the following table.

Note: Accumulation metering data has been excluded from this table, as no changes have been introduced for these metering installations.

	CNDS = Interval Register Level	CNDS = Net
AEMO receive NEM12 MDFF (i.e. 5, 15 or 30 min, Register level)	NEM12 MDFF and CNDS records are both at Register level. Meter data is accepted, processed and loaded into the database.	Where meter reads are received at the register level but the CNDS record are at the Net level, MSATS would calculate the required Net meter reads at time of Settlements by referencing the content in the NEM12 200 line. Where the 200 line is populated correctly, Net reads would be generated by the system and applied to Settlement calculations. Where the NEM12 MDFF 200 line is not populated correctly, i.e. Contributory Suffix = 'N', the system would: • Substitute the kWh reads • Report missing data in the RM11 and MDP Quality and Quantity reports • Report Data Mismatch in the RM39 report
AEMO receive MDMT (i.e. 30-min, Net)	MDMT at Net level and CNDS records at Register level. Meter data is accepted, processed and loaded, however, AEMO's systems would: • Substitute the kWh reads • Report missing data in RM11 and MDP Quality and Quantity reports • Report Data Mismatch in the RM39 report	MDMT and CNDS records are both at Net level. Meter data is accepted, processed and loaded. However, where an MDP sends an MDMT file after 5MS commencement and the IntervalReadDate is greater than the 5MS commencement date, AEMO's system would: • Substitute the kWh reads • Report missing data in the RM11 and MDP Quality and Quantity reports • Report the Data Mismatch in the RM39

CNDS & Meter Data Delivery considerations

	A	New AEMO MDM Go-Live (30-min MDFF)	B	5 and 15-min MDFF Go-Live	C	5MS Commencement	D	GS Commencement

Ref.	CNDS considerations	Meter Data Delivery considerations
A	• CNDS Net records can be converted to Register Level using new DataStreamType codes • Active 1st tier basic and NCONUML CNDS records can be created at any time	• AEMO can still receive MDMF Net interval (in 30 minute intervals) & Accumulation metering data • AEMO will report on missing MDMF data via updated RM11 and RM37 reports • AEMO can receive and process MDFF NEM12 (30-min interval metering data only) and NEM13
B	• CNDS Net records can be converted to Register Level using new DataStreamType codes • Active 1st tier basic and NCONUML CNDS records can be created at any time	• AEMO can still receive MDMF Net interval (in 30 minute intervals) & Accumulation metering data • AEMO will report on missing MDMF data via updated RM11 and RM37 reports • AEMO can receive and process MDFF NEM12 (5, 15 and 30-min interval metering data) and NEM13

C	• Any new records in the CNDS table must be created at the Interval Register level
	• All Active 1st tier basic and NCONUML CNDS records must be created by this date
		• AEMO can still receive MDMF Net interval (in 30 minute intervals) & Accumulation metering data where:
		  • Interval metering data where the IntervalReadDate is less than the 5MS Commencement date
		  • AEMO will report on missing MDMF data via updated RM11 and RM37 reports
		• AEMO can receive and process MDFF NEM12 (5, 15 and 30-min interval metering data) and NEM13

D	• Any new records in the CNDS table must be created at the Interval Register level	• As per Ref 'C' above

CNDS & Meter Data Delivery Scenarios Introduction

The following set of scenarios have been provided to ensure sufficient clarity regarding the prospective or retrospective updating of the CNDS table.

The following scenarios <u>exclude</u> references to:

- DataStreamType

  - Refer to Appendix A: Scenarios - Net & Register level CNDS records

- What CDNS records to create in what scenario

  - Refer to Appendix A: Scenarios - Net & Register level CNDS records

- VIC TUoS related CNDS records

- Any standing data updates made to CATS Master tables other than the CNDS table

CNDS & Meter Data Delivery Scenarios

#	Scenario Description	Allowable CNDS Record Type	AEMO Meter Data delivery: File Type	Example - CNDS Record: Created On date	Example - CNDS Record: Effective Start date
1	Change request created **before** AEMO <u>MDM</u> Go-Live with an effective date **before** AEMO <u>MDM</u> Go-Live	Net (Interval meter) Register (Basic meter)	MDMF - Interval and Accumulation	11 Nov 2020	10 Nov 2020
2	Change request created **after** AEMO <u>MDM</u> Go-Live, effective dated **before** AEMO <u>MDM</u> Go-Live	Net or Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 (30-min reads only pre-5 and 15-min Go-live) or NEM13	12 Mar 2021	3 Nov 2020
3	Change request created **after** AEMO <u>MDM</u> Go-Live, effective dated **after** AEMO <u>MDM</u> Go-Live but **before** *5 and 15-min* Go-live	Net or Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 (30-min reads only pre-5 and 15-min Go-live) or NEM13	18 Apr 2021	25 Mar 2021
4	Change request created **after** AEMO *5 and 15-min* Go-live, effective dated **before** AEMO <u>MDM</u> Go-Live	Net or Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 (30-min reads only pre-5 and 15-min Go-live) or NEM13	10 Apr 2021	5 Feb 2021
5	Change request created **after** AEMO *5 and 15-min* Go-Live, effective dated **after** AEMO <u>MDM</u> Go-Live but **before** 5MS Go-Live	Net or Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 (30-min reads only pre-5 and 15-min Go-live) or NEM13	12 Apr 2021	31 Mar 2021
6	Change request created **after** AEMO *5 and 15-min* Go-Live, effective dated **after** AEMO *5 and 15-min* Go-Live but **before** 5MS Go-Live	Net or Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 or NEM13	14 Apr 2021	15 May 2021
7	Change request created **after** 5MS Go-Live, effective dated **before** 5MS Go-Live	Register (Interval meter) Register (Basic meter)	MDMF - Interval (for reads pre-5MS commencement) and Accumulation MDFF - NEM12 (30-min reads only pre-5 and 15-min Go-live) or NEM13	6 Oct 2021	4 May 2021
8	Change request created **after** 5MS Go-Live, effective dated **after** 5MS Go-Live	Register (Interval meter) Register (Basic meter)	MDFF (NEM12 or NEM13)	10 Oct 2021	9 Oct 2021

VIC TUoS CNDS Records & Meter Data Delivery

To comply with relevant 5MS procedures, MDPs must transition VIC TUoS CNDS records as follows:

- VIC TUoS NMIs with an existing active Data Stream Suffix of Nx:

  - Set the Net NMI Data Stream Suffix to Inactive

  - Stop sending MDMF files

  - Create active Register Level data stream suffixes, to be used for market settlement purposes e.g. Ex and Bx, with a datastream type code of 'I'

  - Ensure all other non-market settlement datastream or profiling suffixes e.g. Cx, Fx, Kx, Lx, Qx, Rx have a datastream type code of 'N' applied

  - Notify AEMO when these changes are completed, as there are a number of manual processes that need to be performed once the meter updates have occurred

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

  - Send MDFF data to NEMMCO (not VPXP)

    - This is the same file MDPs are currently sending to B2B Participants.

Feedback

Your feedback

Your feedback is welcomed and should be directed to 5MS@aemo.com.au

AEMO will maintain an up-to-date version of this PowerPoint. i.e. this is a 'live' document.

Appendix A: Scenarios - Net & Register level CNDS records

Net & Register Level CNDS scenarios

The following set of scenarios are based on physical <u>interval</u> *metering installations* identifying:

- <u>Required</u> CNDS records for NEM Settlement calculations
- Applicable DataStreamType codes
- Indicative ADL values

The following scenarios <u>exclude</u> references to:

- Key dates
- CATS Change request 'Created On' or 'Effective Start Date' values

Scenario 1: An interval metered NMI for NEM Settlement calculations

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State	Ex Bx	Ex Bx	Nx	I	15
Final State	Ex Bx	Ex Bx	Ex Bx	I I	16 -1

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 16 + (-1) = 15

Scenario 2: A sample meter NMI for Controlled Load Profile calculation

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State	Ex	Ex	Nx	P	5
Final State	Ex	Ex	Ex	P	5

Scenario 3: An interval metered NMI with Controlled Load

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State	E1 B1 E2 B2	E1 B1 E2 B2	N1 N2	I I	20 5
Final State	E1 B1 E2 B2	E1 B1 E2 B2	E1 B1 E2 B2	I I I I	31 -11 12 -7

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 31 + (-11) = 20

Scenario 4: An interval metered NMI with Solar

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State	E1 B1	E1 B1	N1	I	14
Final State	E1 B1	E1 B1	E1 B1	I I	19 -5

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 19 + (-5) = 14

Scenario 5: An interval metered NMI included in Vic TUOS and NEM Settlements

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current Day	E1 B1 Q1 K1	E1 B1 Q1 K1	E1 B1 Q1 K1 N1	1 2 3 4 I	5,000 0 0 0 5,000
Final State	E1 B1 Q1 K1	E1 B1 Q1 K1	E1 B1 Q1 K1	I I N N	5,232 -232 1 1

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 5,232 + (-232) = 5,000

Scenario 6: An interval metered NMI for Vic TUOS only

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current Day	E1 B1 Q1 K1	E1 B1 Q1 K1	E1 B1 Q1 K1	1 2 3 4	3,420 0 0 0
Final State	E1 B1 Q1 K1	E1 B1 Q1 K1	E1 B1 Q1 K1	N N N N	3,720 -300 1 1

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 3,720 + (-300) = 3,420

Scenario 7: An interval metered NMI with Master & Check Meters

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State – Master Meter	Ex Bx Qx Kx	Ex Bx Qx Kx	Nx	I	500
Current State – Check Meter	Fx Cx Rx Lx	Fx Cx Rx Lx	N/A	N/A	N/A
Final State – Master Meter	Ex Bx Qx Kx	Ex Bx Qx Kx	Ex Bx Qx Kx	I I N N	512 -12 1 1
Final State – Check Meter	Fx Cx Rx Lx	Fx Cx Rx Lx	Fx Cx Rx Lx	N N N N	1 1 1 1

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 512 + (-12) = 500

Scenario 8: An interval metered NMI with Master, Check and Logical Meters

	Physical Meter	CATS_Meter_Register, 'Suffix'	CATS_NMI_Data_Stream		
			'DataStreamSuffix'	'DataStreamType'	ADL
Current State – Master Meter	Ex Bx Qx Kx	Ex Bx Qx Kx	Nx	I	14,400
Current State – Check Meter	Fx Cx Rx Lx	Fx Cx Rx Lx	N/A	N/A	N/A
Current State – Logical Meter	Dx Ax Px Jx	Dx Ax Px Jx	N/A	N/A	N/A
Final State – Master Meter	Ex Bx Qx Kx	Ex Bx Qx Kx	Ex Bx Qx Kx	N N N N	1 1 1 1
Final State – Check Meter	Fx Cx Rx Lx	Fx Cx Rx Lx	Fx Cx Rx Lx	N N N N	1 1 1 1
Final State – Logical Meter	Dx Ax Px Jx	Dx Ax Px Jx	Dx Ax Px Jx	I I N N	15,003 -603 1 1

* The summation of all ADL values shall result in the Total ADL for the NMI. E.g. 15,003 + (-603) = 14,400