3 March 2021

Level 22
530 Collins Street
Melbourne VIC 3000

Postal Address:
GPO Box 2008
Melbourne VIC 3001

T 1300 858724
F 03 9609 8080

Ms Anna Collyer
Chair
Australian Energy Market Commission
Sydney South NSW 1235

By online submission

Dear Ms. Collyer

Review of the regulatory framework for metering services (EMO0040)

The Australian Energy Market Operator (AEMO) welcomes the opportunity to provide feedback on the Australian Energy Market Commission's (AEMC) Review of the regulatory framework for metering services in the National Electricity Market (NEM) (Consultation Paper) published on 3 December 2020.

AEMO is keen to work with the AEMC to identify opportunities and assess potential solutions, which could improve the framework for metering services in the NEM through this review. Whilst AEMO has no specific responses to the questions raised in the AEMC's consultation paper, the following matters are highlighted for the AEMC's consideration as they relate to the operation of the metering framework:

- Technical improvements and clarifications in Schedule 7 of the National Electricity Rules (NER) – Over time, AEMO has liaised with participant and provider groups who are required to interact and comply with Schedule 7 of the NER. As a result of various AEMO led reviews, for the most part in collaboration with NEM accredited Metering Providers, technical improvements and clarifications have been identified within the Schedule. Proposed changes with annotations referring to their provenance are provided in Appendix A to this letter.
- Other minor amendments to Schedule 7 of the NER – Resulting from the MSATS Standing Data Review, conducted by AEMO in consultation with interested parties in 2020, minor amendments are proposed to Schedule 7 of the NER. Proposed changes are provided in Appendix A.
- Access to National Metering Identifier (NMI) Standing Data – AEMO considers that the provisions of NER 7.15.5(e) might be unnecessarily limiting. The current drafting provides that a retailer may access and receive NMI Standing Data. Other market participant roles, such as a Market Small Generation Aggregator, might also benefit from access to NMI Standing Data in order that they can be similarly informed as a retailer when seeking to offer services to a customer at a connection point.

Should you wish to discuss any of the matters raised in this submission, please contact Kevin Ly, Group Manager Regulation on kevin.ly@aemo.com.au.

Yours sincerely

Tony Chappel
Chief External Affairs Officer

Attachment A: Metering framework review (Proposed amendments to Schedule 7 of the NER).

Appendix A – Metering framework review

Proposed amendments to Schedule 7 of the NER

Schedule 7.1 Metering register

S7.1.1 General

(a) The *metering register* forms part of the *metering database* and holds static *metering* information associated with *metering installations* defined by the *Rules* that determines the validity and accuracy of *metering data*.

(b) The purpose of the *metering register* is to facilitate:

(1) the registration of *connection points*, *metering points* and affected *Registered Participants*;

(2) the verification of compliance with the *Rules*; and

(3) the auditable control of changes to the registered information.

S7.1.2 Metering register information

Metering information to be contained in the *metering register* should include, but is not limited to the following:

(a) *Connection* and *metering point* reference details~~, including:~~

~~(1) agreed locations and reference details (eg drawing numbers);~~

~~(2) loss compensation calculation details;~~

~~(3) site identification names;~~

~~(4) details of *Market Participants* and *Local Network Service Providers* associated with the *connection point* and the *Embedded Network Manager* in relation to a *child connection point*;~~

~~(5) details of the *Metering Coordinator*; and~~

~~(6) transfer date for *Second Tier Customer* and *Non-Registered Second Tier Customer metering data* (i.e. to another *Market Customer*).~~

(b) The identity and characteristics of *metering* equipment~~ (ie *instrument transformers*, *metering installation* and *check metering installation*), including:~~

~~(1) serial numbers;~~

~~(2) *metering installation* identification name;~~

~~(3) *metering installation* types and models;~~

~~(4) *instrument transformer* ratios (available and connected);~~

~~(5) current test and calibration programme details, test results and references to test certificates;~~

~~(6) asset management plan and testing schedule;~~

Commented [AEMO1]: S7.1.2 – Metering register information.

These proposed changes have resulted from the work undertaken by AEMO, in consultation with interested parties, on the MSATS Standing Data Review in 2020. AEMO identified several items currently included in the clause that are no longer relevant (e.g. the inclusion of a password field is related to legacy metering system designs). More generally, AEMO considers that the list should provide high level guidance that enables the metering information to adapt with evolving technologies and market needs. Within the MSATS Standing Data Review, feedback from interested parties indicated general agreement with AEMO's proposal to amend the clause (as proposed in the drafting).

~~(7) calibration tables, where applied to achieve *metering installation* accuracy;~~

~~(8) *Metering Provider*(s) and *Metering Data Provider*(s) details;~~

~~(9) summation scheme values and multipliers; and~~

~~(10) data register coding details.~~

(c) Data communication details~~, including:~~

~~(1) telephone number(s) for access to *energy data*;~~

~~(2) communication equipment type and serial numbers;~~

~~(3) communication protocol details or references;~~

~~(4) data conversion details;~~

~~(5) user identifications and access rights; and~~

~~(6) 'write' password (to be contained in a hidden or protected field).~~

(d) Data validation, substitution and estimation processes agreed between affected parties~~, including:~~

~~(1) algorithms;~~

~~(2) data comparison techniques;~~

~~(3) processing and alarms (eg *voltage* source limits; phase angle limits);~~

~~(4) *check metering* compensation details; and~~

~~(5) alternate data sources.~~

(e) Data processing prior to the *settlement* process~~, including algorithms for:~~

~~(1) *generation* half-hourly 'sent out' calculation;~~

~~(2) customer half-hourly *load* calculation; and~~

~~(3) *Local Retailer* net *load* calculation.~~

Schedule 7.2 Metering Provider

S7.2.1 General

(a) A *Metering Provider* must be accredited by and registered by *AEMO*. *AEMO* must accredit and register a *Metering Provider* only for the type of work the *Metering Provider* is qualified to provide.

(b) *AEMO* must establish a qualification process for *Metering Providers* that enables registration to be achieved in accordance with the requirements of this Schedule 7.2.

(c) A *Metering Provider* must have the necessary licences in accordance with appropriate State and Territory requirements.

(d) A *Metering Provider* must ensure that any *metering* equipment it installs is suitable for the range of operating conditions to which it will be exposed (e.g. temperature; impulse levels), and operates within the defined limits for that equipment.

S7.2.2 Categories of registration

(a) Registrations for *Metering Providers* in relation to the provision, installation and maintenance of *metering installation* types 1, 2, 3, 4 and 4A must be categorised in accordance with Tables S7.2.2.1, S7.2.2.2 and S7.2.2.3, or other procedures approved by *AEMO*.

(b) Registrations for *Metering Providers* in relation to the provision, installation and maintenance (unless otherwise specified) of *metering installation* types 5 and 6 must be categorised in accordance with Table S7.2.2.4 with the capabilities established in the *metrology procedures*.

(c) Registration for *Metering Providers* in relation to the provision, installation and maintenance of *small customer metering installations* must be categorised in accordance with Tables S7.2.2.2 and satisfy the requirements in clause S7.2.5.

(d) *AEMO* may establish *Accredited Service Provider categories* of registration for a *Metering Provider* in accordance with clause S7.2.6.

Table S7.2.2.1 Categories of registration for accreditation

Category	Competency
1C	Class 0.2 CTs with < 0.1% uncertainty.
1V	Class 0.2 VTs with < 0.1% uncertainty.
1M	Class 0.2 Wh meters with < 0.1/cosφ% uncertainty and class 0.5 varh meters with <0.3/sinφ uncertainty.
1A	Class 0.2 CTs, VTs, Wh meters; class 0.5 varh meters; the total installation to 0.5%. Wh with < 0.2% uncertainty at unity *power factor*; 1.0% for varh with <0.4% uncertainty at zero *power factor*.
2C	Class 0.5 CTs with < 0.2% uncertainty.
2V	Class 0.5 VTs with < 0.2% uncertainty.
2M	Class 0.5 Wh meters with < 0.2/cosφ uncertainty and class 1.0 varh meters with <0.4/sinφ uncertainty.
2A	Class 0.5 CTs, VTs, Wh meters; class 1.0 varh meters; the total installation to 1.0%. Wh with < 0.4% uncertainty at unity *power factor*; 2.0% for varh with <0.5% uncertainty at zero *power factor*.

Table S7.2.2.2 Categories of registration for accreditation

Category	Competency
3M	Class 1.0 Wh meters with < 0.3/cosφ uncertainty and class 2.0 varh meters with <0.5/sinφ% uncertainty.
3A	Class 0.5 CTs, VTs; class 1.0 Wh meters; class 2.0% varh meters; the total installation to 1.5%. Wh with < 0.5% uncertainty at unity *power factor*; 3.0% for varh with <0.6% uncertainty at zero *power factor*.
4M	Class 1.0 Wh meters and class 1.5 Wh meters with <0.3/cosφ% uncertainty.
4A	Class 1.0 Wh meters and class 1.5 Wh meters with <0.3/cosφ% uncertainty.
4S	Class 1.0Wh meters and class 1.5 Wh meters with <0.3/cosφ% uncertainty.

Table S7.2.2.3 Categories of registration for accreditation

Category	Competency
L	Approved *communications interface* installer

Table S7.2.2.4 Categories of registration for accreditation

Category	Competency
5A Installation only	Class 1.0 and class 1.5 whole current Wh *meters* with <0.3/cosΦ% uncertainty.
6A Installation only	Class 1.5 whole current Wh *meters* with <0.3/cosΦ% uncertainty.
5B	Class 1.0 and class 1.5 whole current or CT connected Wh *meters* with <0.3/cosΦ% uncertainty.
6B	Class 1.5 whole current or CT connected Wh *meters* with 0.3</cosΦ% uncertainty.

S7.2.3 Capabilities of Metering Providers for metering installations types 1, 2, 3, 4 and 4A

Category 1A, 2A, 3A and 4M *Metering Providers* must be able to exhibit the following capabilities to the reasonable satisfaction of *AEMO*:

(a) Detailed design and specification of *metering* schemes, including:

(1) knowledge and understanding of this Chapter 7;

(2) knowledge of equipment (*meters*, *current transformers* and where applicable *voltage transformers*);

(3) design experience including knowledge of *current transformers* and where applicable *voltage transformers* and the effect of burdens on performance;

(4) ability to calculate summation scheme values, multipliers, etc; and

(5) ability to produce documentation, such as single line diagrams, panel layouts and wiring diagrams.

(b) Programming and certification requirements for *metering installations* to the required accuracy, including:

(1) licensed access to *metering* software applicable to all equipment being installed by the *Metering Provider*;

(2) ability to program requirements by setting variables in *meters*, summators, modems, etc;

(3) management of the testing of all equipment to the accuracy requirements specified in this Chapter 7;

(4) certifications that all calibration and other *meter* parameters have been set, verified and recorded prior to *meters*, and other components of the *metering installation* being released for installation;

(5) all reference/calibration equipment for the purpose of meeting test or inspection obligations must be tested to ensure full traceability to test certificates issued by a *NATA* accredited body or a body recognised by *NATA* under the International Laboratory Accreditation Corporation (**ILAC**) mutual recognition scheme and documentation of the traceability must be provided to *AEMO* on request; and

(6) compliance with ISO/IEC Guide 25 "General Requirements for the Competence of Calibration and Testing Laboratories" with regard to the calculation of uncertainties and accuracy.

(c) Installation and commissioning of *metering installations* and, where necessary, the *communications interface* to facilitate the *remote acquisition* of *metering data*, including:

(1) the use of calibrated test equipment to perform primary injection tests and field accuracy tests;

(2) the availability of trained and competent staff to install and test *metering installations* to determine that installation is correct; and

(3) the use of test procedures to confirm that the *metering installation* is correct and that *metering* constants are recorded and/or programmed correctly.

(d) Inspection and maintenance of *metering installations* and equipment, including:

(1) regular readings of the measurement device where external recording is used (6 monthly) and verification with *AEMO* records;

(2) approved test and inspection procedures to perform appropriate tests as detailed in this Chapter 7;

(3) calibrated field test equipment for primary injection and *meter* testing to the required levels of uncertainty; and

(4) secure documentation system to maintain *metering* records for all work performed on a *metering installation*, including details of the security method used.

(e) Verification of *metering data* and *check metering data*, as follows:

(1) on commissioning *metering data*, verification of all readings, constraints (adjustments) and multipliers to be used for converting raw data to consumption data; and

(2) on inspection, testing and/or maintenance, verification that readings, constants and multipliers are correct by direct conversion of *meter* readings and check against the *metering database*.

(f) Quality System as AS 9000 series standards, including:

(1) a quality system to AS/NZ ISO 9000 series applicable to the work to be performed:

Type 1 full implementation of AS/NZ ISO 9002;

Type 2 full implementation of AS/NZ ISO 9002;

Type 3 – implementation of AS/NZ ISO 9002 to a level agreed with *AEMO*;

Type 4 implementation of AS/NZ ISO 9002 to a level agreed with *AEMO*;

Type 4A – implementation of AS/NZ ISO 9002 to a level agreed with *AEMO*;

(2) the calculations of accuracy based on test results are to include all reference standard errors;

(3) an estimate of Testing Uncertainties which must be calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement"; and

(4) a knowledge and understanding of the appropriate standards and guides, including those in the *Rules*.

(g) All of the capabilities relevant to that type of *metering installation* which are set out in the *Rules* and procedures authorised under the *Rules*.

S7.2.4 Capabilities of Metering Providers for metering installations types 5 and 6

Metering Providers, who apply for categories of *Metering Provider* accreditation of *metering installations* types 5 and/or 6, must be able to exhibit, to the reasonable satisfaction of *AEMO* all of the capabilities relevant to that type of *metering*

installation which are set out in the *Rules* and procedures authorised under the *Rules*.

S7.2.5 Capabilities of Metering Providers for small customer metering installations

Category 4S *Metering Providers* must be able to exhibit, to the reasonable satisfaction of *AEMO*:

(a) all of the capabilities in S7.2.3; and

(b) the establishment of an appropriate security control management plan and associated infrastructure and communications systems for the purposes of preventing unauthorised local access or remote access to *metering installations*, services provided by *metering installations* and *energy data* held in *metering installations*.

S7.2.6 Capabilities of the Accredited Service Provider category

(a) The *Accredited Service Providers categories* established by *AEMO* under clause S7.2.2(d) may perform work relating to the installation of any types 1, 2, 3, 4, 4A, 5 or 6 *metering installations*.

(b) *AEMO* must include *Accredited Service Provider categories* in the accreditation guidelines prepared and *published* under clause 7.4.1(c).

(c) *AEMO* may determine:

(1) the competencies of a *Metering Provider* registered in each *Accredited Service Provider category* provided that those competencies are consistent with any capabilities established in the *metrology procedure* in respect of the work performed under paragraph (a); and

(2) different competencies for each *Accredited Service Provider category* for each *participating jurisdiction*.

Schedule 7.3 Metering Data Provider

S7.3.1 General

(a) A *Metering Data Provider* must be accredited by and registered by *AEMO*.

(b) *AEMO* must accredit and register a *Metering Data Provider* only for the type of work the *Metering Data Provider* is qualified to provide.

(c) *AEMO* must establish a qualification process for *Metering Data Providers* that enables registration to be achieved in accordance with the requirements of this Schedule 7.3.

S7.3.2 Categories of registration

Categories of registration are set out in Table S7.3.2.1.

Table S7.3.2.1 Categories of registration for accreditation

Metering installation **type**	**Categories of registration**	
1, 2, 3 and/or 4	Category 1D, 2D, 3D and/or 4D (for *remote acquisition*, processing and delivery of *metering data* for *connection points*)	Category 4S (for *small customer metering installations* in relation to *remote acquisition*, processing and delivery of *metering data* for *connection points*)
4A, 5 and/or 6	Category 4AC, 5C and/or 6C (for manual collection or *remote acquisition* of *metering data*)	Category 4AD, 5D and/or 6D (for manual collection, processing and delivery of *metering data* or for *remote acquisition*, processing and delivery of *metering data*)
7	Category 7D (for processing and delivery of *calculated metering data*)	

Commented [AEMO2]: Administrative change

S7.3.3 Capabilities of Metering Data Providers

Metering Data Providers must be able to exhibit to the reasonable satisfaction of *AEMO* the following capabilities, as applicable, for the categories of *Metering Data Provider* accreditation sought:

(a) Detailed understanding of the *Rules*, and all procedures authorised under the *Rules* including the relevant *service level procedures* relating to the function of a *Metering Data Provider* and the carrying out of *metering data services*.

(b) Detailed understanding of the participant role relationships and obligations that exist between the *Metering Data Provider*, *Metering Provider*, *financially responsible Market Participant*, *Local Network Service Provider*, *AEMO* and the *Metering Coordinator*.

(c) An understanding of *metering* arrangements, including knowledge of *metering* equipment (*meters*, *current transformers* and *voltage transformers*).

(d) Authorised access to *metering* software for the:

(1) collection of *metering data*;

(2) establishment, maintenance and operation of a *metering data services database* for the storage and management of *metering data* and *NMI Standing Data*; and

(3) the validation, substitution and estimation of *metering data*.

(e) Processes and systems for the collection of *metering data* including:

(1) knowledge of manual collection and *remote acquisition* of *metering data* (as applicable);

(2) collection technologies and methodologies; and

(3) *metering* protocols and equipment.

(f) Systems for the processing of *metering data* including:

(1) processes for the verification and commissioning of *metering data* and relevant *NMI Standing Data* pertaining to each *metering installation* into the *metering data services database*;

(2) processes for validation, substitution and estimation of *metering data*;

(3) processes for the storage, adjustment and aggregation of *metering data*; and

(4) the secure storage of historical data.

(g) Processes for the delivery of *metering data* and relevant *NMI Standing Data* to *Registered Participants* and *AEMO* including:

(1) delivery performance requirements for *metering data*; and

(2) an understanding of the relevant *metering data* file formats.

(h) The availability of trained and competent staff to:

(1) read or interrogate the *metering installation*;

(2) collect and process *metering data* into the *metering data services database*;

(3) validate, substitute or estimate *metering data* as the case may be;

(4) maintain the physical and logical security of the *metering data services database* and only allow access to *metering data* by those persons entitled to receive *metering data*; and

(5) ensure the ongoing performance and availability of the collection process and the *metering data services database* are maintained inclusive of necessary system supports for backup, archiving and disaster recovery.

(i) The establishment of a quality system which will:

(1) underpin all operational documentation, processes and procedures;

(2) facilitate good change control management of procedures, IT systems and software;

(3) provide audit trail management of *metering data* and *NMI Standing Data*;

(4) maintain a security control management plan;

(5) maintain security controls and data integrity; and

(6) maintain knowledge and understanding of the *Rules* and relevant procedures, standards and guides authorised under the *Rules*.

(j) Understanding of the required logical interfaces necessary to support the provision of *metering data services* including the interfaces needed to:

(1) access *AEMO's* systems for the management and delivery of *metering data*;

(2) support *B2B procedures*; and

(3) support *Market Settlement and Transfer Solution Procedures* for delivery and update of *NMI Standing Data*.

S7.3.4 Capabilities of Metering Data Providers for small customer metering installations

Category 4S *Metering Data Providers* must be able to exhibit, to the reasonable satisfaction of *AEMO*:

(a) all the capabilities in S7.3.3; and

(b) the establishment of an appropriate security control management plan and associated infrastructure and communications systems for the purposes of preventing unauthorised local access or remote access to *metering installations*, services provided by *metering installations* and *energy data* held in *metering installations*.

Schedule 7.4 Types and Accuracy of Metering installations

S7.4.1 General requirements

(a) ~~(a)~~ This Schedule 7.4 sets out the minimum requirements for *metering installations*.

(b) When extended range current transformers are used, the overall accuracy requirements at loads greater than 100% rated load must not exceed the overall accuracy requirements specified within the *Rules* for 100% rated load.

(c) Extended range current transformers must not to be used beyond the limits of their extended range.

~~(a)~~(d) For Type 4, 5 and 6 *metering installations* which are direct connected or have current transformer(s), the *Metering Provider* is permitted to demonstrate accuracy requirements of the *metering installation* by means of using a generic design. The generic design must consider the error limits for the class accuracy of the equipment and calculated or measured burden or loads to demonstrate compliance. Each generic design must include conditions under which it may be applied.

Commented [AEMO3]: S7.4.1 General requirements
The addition of these clauses is for clarification purposes and was recommended as part of a Meter Testing Review – AEMO in consultation with Metering Provider and Responsible Person representatives.

Commented [AEMO4]: S7.4.1 General requirements
The addition of this clause is for clarification purposes and results from recommendations of the Metering Working Group, chaired by AEMO and resourced with representatives of Metering Providers and Responsible Persons.

S7.4.2 Metering installations commissioned prior to 13 December 1998

(a) This clause provides conditions that are to apply to *metering installations* that were commissioned prior to 13 December 1998.

(b) The use of *metering* class *current transformers* and *voltage transformers* that are not in accordance with Table S7.4.3.1 are permitted provided that where necessary to achieve the overall accuracy requirements:

(1) *meters* of a higher class accuracy are installed; and/or

(2) calibration factors are applied within the *meter* to compensate for *current transformer* and *voltage transformer* errors.

(c) Protection *current transformers* are acceptable where there are no suitable *metering* class *current transformers* available and the overall accuracy and performance levels can be met.

(d) Where the requirements of paragraph (b) and (c) cannot be achieved then the *Metering Coordinator* is required to comply with transitional arrangements or obtain an exemption from *AEMO* or upgrade the *metering installation* to comply with this Schedule 7.4.

(e) The arrangements referred to in paragraph (d) may remain in force while the required accuracy and performance can be maintained within the requirements of the *Rules*.

(f) The purchase of new *current transformers* and *voltage transformers* must comply with the *Rules*.

S7.4.3 Accuracy requirements for metering installations

(a) The maximum allowable overall error (±%) at different loads and power factors is set out in Table S7.4.3.2 to Table S7.4.3.6.

(b) All measurements in Tables S7.4.3.2 – S7.4.3.6 are to be referred to 25 degrees Celsius.

(c) The method for calculating the overall error is the vector sum of the errors of each component part (that is, a + b + c) where:

(1) a = the error of the voltage transformer and wiring;

(2) b = the error of the current transformer and wiring; and

(3) c = the error of the meter.

(d) If compensation is carried out then the resultant metering data error shall be as close as practicable to zero.

(e) The maximum allowable error of a type 5 or type 6 *metering installation* may be relaxed in the *metrology procedure* to accommodate evolving technologies providing that such relaxation is consistent with any regulations published under the *National Measurement Act*.

Table S7.4.3.1 ~~Overall~~ Accuracy Class Requirements of Metering Installation Components

Type	Volume limit per annum per connection point	~~Maximum allowable overall error (±%) at full load (Item 6)~~ ~~active~~	~~reactive~~	Minimum acceptable class or standard of components	Metering installation clock error (seconds) in reference to EST
1	greater than 1000GWh	~~0.5~~	~~1.0~~	0.2CT/VT/*meter* Wh 0.5 *meter* varh	±5

Commented [AEMO5]: Repositioned text currently presented in **Item 6** and Notes to the bottom of the tables. Proposed to be repositioned as a lead-in to the section as it is important for the reader to understand this information prior to the table presentation for clarity.

Commented [AEMO6]: Sourced from Item 3b and 4b in section below tables:
Moved to improve clarity and interpretation of this section in general.

Commented [AEMO7]: Renamed to reflect amendments proposed in the table below.

Commented [AEMO8]: S7.4.3 Accuracy requirements for metering installations
The information in this column is replicated in later tables and is therefore superfluous here. Deletion will aid ease of understanding, remove the duplication and and by doing so, remove the risk of contradiction and confusion in the future.

Type	Volume limit per annum per connection point	~~Maximum allowable overall error (±%) at full load (Item 6)~~ ~~active~~	~~reactive~~	Minimum acceptable class or standard of components	Metering installation clock error (seconds) in reference to EST
2	100 to 1000GWh	~~1.0~~	~~2.0~~	0.5CT/VT/*meter* Wh 1.0 *meter* varh	±7
3	0.75 to less than 100 GWh	~~1.5~~	~~3.0~~	0.5CT/VT 1.0 *meter* Wh 2.0 *meter* varh (Item 1)	±10
4	less than 750 MWh (Item 2)	~~1.5~~	~~n/a~~	Either 0.5 CT and 1.0 *meter* Wh; or whole current general purpose *meter* Wh: • meets requirements of clause 7.8.2(a)(9); and • meets the requirements of clause 7.10.7(a). (Item 1)	±20 (Item 2a)
4A	less than x MWh Item 3	~~1.5~~	~~3.0~~	Either 0.5 CT and 1.0 *meter* Wh; or whole current general purpose *meter* Wh: • meets the requirements of clause 7.8.2(a)(10); and • has the capability, if remote access is activated, of providing the services in table S7.5.1.1; and	±20 (Item 2a)

Commented [AEMO8]: S7.4.3 Accuracy requirements for metering installations
The information in this column is replicated in later tables and is therefore superfluous here. Deletion will aid ease of understanding, remove the duplication and and by doing so, remove the risk of contradiction and confusion in the future.

Type	Volume limit per annum per connection point	~~Maximum allowable overall error (±%) at full load (Item 6)~~ ~~active~~	~~reactive~~	Minimum acceptable class or standard of components	Metering installation clock error (seconds) in reference to EST
				• meets the requirements of clause 7.10.7(d).	
5	less than x MWh (Item 3)	~~1.5~~ ~~(Item 3b)~~	~~n/a~~	Either 0.5 CT and 1.0 meter Wh; or whole current connected general purpose meter wh: • meets requirements of clause 7.8.2(a)(10); and • meets the requirements of clause 7.10.7(d). (Item 1)	'±/-20' (Item 3a)
6	less than y MWh (Item 4)	~~2.0~~ ~~(Item 4b)~~	~~n/a~~	CT or whole current general purpose *meter* Wh recording *accumulated energy data* only. Processes used to convert the *accumulated metering data* into *trading interval metering data* and *estimated metering data* where necessary are included in the *metrology procedure*. (Item 1)	(Item 4a)
7	volume limit not specified (Item 5)	~~(Item 6)~~	~~n/a~~	No *meter*. The *metering data* is *calculated metering data* determined in accordance with the *metrology procedure*.	n/a

Commented [AEMO8]: S7.4.3 Accuracy requirements for metering installations
The information in this column is replicated in later tables and is therefore superfluous here. Deletion will aid ease of understanding, remove the duplication and and by doing so, remove the risk of contradiction and confusion in the future.

Item 1:

(a) For a type 3, 4, 4A and 5 and 6 *metering installation*, whole current *meters* may be used if the *meters* meet the requirements of the relevant *Australian Standards* and International Standards which must be identified in the *metrology procedure*.

(b) The *metering installation* types referred to in paragraph (a) must comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Measurement Institute under the *National Measurement Act*.

Item 2: *High voltage* customers that require a VT and whose annual consumption is below 750 MWh, must meet the relevant accuracy requirements of Type 3 *metering* for *active energy* only.

Item 2a: For the purpose of clarification, the clock error for a type 4 and 4A *metering installation* may be relaxed in the *metrology procedure* to accommodate evolving whole current technologies.

Item 3: The following requirements apply in relation to a type 4A and type 5 *metering installation*:

(1) the value of "x" must be determined by each *Minister* of a *participating jurisdiction* and:

(i) the "x" value must be provided to *AEMO*; and

(ii) *AEMO* must record the "x" value in the *metrology procedure*;

(2) the maximum acceptable value of "x" determined under subparagraph (1) must be 750 MWh per annum; and

Item 3a: For the purpose of clarification, the clock error for a type 5 *metering installation* may be relaxed in the *metrology procedure* to accommodate evolving whole current technologies.

~~Item 3b:~~ ~~The maximum allowable error of a type 5 *metering installation* may be relaxed in the *metrology procedure* to accommodate evolving technologies providing that such relaxation is consistent with any regulations published under the *National Measurement Act*.~~

Commented [AEMO9]: Item 3b:
AEMO considers this clause, and the companion 'Item 4b' below, are better placed in the lead-in section to this clause in the Rules.

Item 4: The following requirements apply in relation to a type 6 *metering installation*:

(1) a *metrology procedure* must include a procedure relating to converting *active energy* into *metering data*;

(2) the value of "y" must be determined by each *Minister* of a *participating jurisdiction* and:

(i) the "y" value must be provided to *AEMO*; and

(ii) *AEMO* must record the "y" value in the *metrology procedure*;

(3) the maximum acceptable value of "y" determined under subparagraph (2) must be 750 MWh per annum;

(4) devices within the *metering installation* may record *accumulated energy data* in pre determined daily time periods where such time periods are contained in the *metrology procedure*.

Item 4a: Any relevant clock errors for a type 6 *metering installation* are to be established in the *metrology procedure*.

~~Item 4b:~~ ~~The maximum allowable error of a type 6 *metering installation* may be relaxed in the *metrology procedure* providing that such relaxation is consistent with any regulations *published* under the *National Measurement Act*.~~

Commented [AEMO10]: Item 4b:
See note regarding Item 3b above.

Item 5:

(a) A type 7 *metering installation* classification applies where a *metering installation* does not require a *meter* to measure the flow of electricity in a power conductor and accordingly there is a requirement to determine by other means the *metering data* that is deemed to correspond to the flow of electricity in the power conductor.

(b) The condition referred to in paragraph (a) will only be allowed for *connection points* where *AEMO* in consultation with the *Metering Coordinator* determines:

(1) the *load* pattern is predictable;

(2) for the purposes of *settlements*, the *load* pattern can be reasonably calculated by a relevant method set out in the *metrology procedure*; and

(3) it would not be cost effective to meter the *connection point* taking into account:

(i) the small magnitude of the *load*;

(ii) the *connection* arrangements; and

(iii) the geographical and physical location.

(c) The *metrology procedure* must include arrangements for type 7 *metering installations* that have been classified as *market loads*.

(d) A *connection point* that meets the condition for classification as a type 7 *metering installation* does not prevent that *connection point* from being subject to *metering* in the future.

~~Item 6:~~ ~~The maximum allowable overall error (±%) at different *loads* and *power factors* is set out in Table S7.4.3.2 to Table S7.4.3.6.~~

Commented [AEMO11]: Item 6:
Repositioned as a lead-in to the section – important for the reader to understand the information prior to the table presentation

Table S7.4.3.2 Type 1 Metering Installation Overall Accuracy Requirements – Annual Energy Throughput greater than 1,000 GWh

Commented [AEMO12]: Table S7.4.3.2 Type 1 Installation – Annual Energy Throughput greater than 1,000 GWh

"N/A" has been replaced with "not used" for clarification purposes and, where applicable, the values have been updated to reflect current industry practice.

Table title reworded to reflect amendments proposed in this section

% Rated Load	Power Factor					
	Unity	0.866 lagging		0.5 lagging		Zero
	active	active	reactive	active	reactive	reactive
10	1.0%	1.0%	2.0%	not used~~n/a~~	not used~~n/a~~	1.4%

% Rated Load	Power Factor					
	Unity	0.866 lagging		0.5 lagging		Zero
	active	active	reactive	active	reactive	reactive
50	0.5%	0.5%	1.40%	0.7%	1.04%	1.0%
100	0.5%	0.5%	1.0%	not used~~n/a~~	not used~~n/a~~	1.0%

Commented [AEMO13]: Changes proposed to values in the tables here and in tables below for technical accuracy

Table S7.4.3.3 Type 2 Metering Installation Overall Accuracy Requirements – Annual Energy Throughput between 100 and 1,000 GWh

Commented [AEMO14]: Table title reworded to reflect amendments proposed in this section

% Rated Load	Power Factor					
	Unity	0.866 lagging		0.5 lagging		Zero
	active	active	reactive	active	reactive	reactive
10	2.0%	2.0%	4.0%	not used~~n/a~~	not used~~n/a~~	2.8%
50	1.0%	1.0%	3~~2~~.0%	1.5%	2~~3~~.0%	2.0%
100	1.0%	1.0%	2.0%	not used~~n/a~~	not used~~n/a~~	2.0%

Table S7.4.3.4 Type 3 Metering Installation Overall Accuracy Requirements – Annual Energy Throughput from 0.75 GWh to less than 100 GWh and Type 4 Category 4S and Type 4A Installation - Annual Energy Throughput less than 0.75 GWh

Commented [AEMO15]: Table S7.4.3.4
Since Type 4A and Type 4 Category S meters have the same technical requirements under the NER, this change (and the below) is to make clear to participants that Table S7.4.3.4 applies also to meters under clause S7.2.5, and that Table S7.4.3.5 applies to all other Type 4 meters.

Table title reworded to reflect amendments proposed in this section

% Rated Load	Power Factor					
	Unity	0.866 lagging		0.5 lagging		Zero
	active	active	reactive	active	reactive	reactive
10	2.5%	2.5%	5.0%	not used~~n/a~~	not used~~n/a~~	4.0%
50	1.5%	1.5%	4~~3~~.0%	2.5%	3~~5~~.0%	3.0%
100	1.5%	1.5%	3.0%	not used~~n/a~~	not used~~n/a~~	3.0%

Table S7.4.3.5 Type 4 (other than Category 4S) or 5 Metering Installation Overall Accuracy Requirements – Annual Energy Throughput less than 0.75 GWh

Commented [AEMO16]: Table S7.4.3.5
Refer to comment above regarding the heading for Table S7.4.3.4

% Rated Load	Power Factor		
	Unity	0.866 lagging	0.5 lagging
	Active	active	active
10	2.5%	2.5%	not used~~n/a~~

% Rated Load	Power Factor		
	Unity	0.866 lagging	0.5 lagging
	Active	active	active
50	1.5%	1.5%	2.5%
100	1.5%	1.5%	not used~~n/a~~

Table S7.4.3.6 Type 6 Metering Installation Overall Accuracy Requirements – Annual Energy Throughput less than 0.75 GWh

Commented [AEMO17]: Table title reworded to reflect amendments proposed in this section

% Rated Load	Power Factor		
	Unity	0.866 lagging	0.5 lagging
	Active	active	active
10	3.0%	not used~~n/a~~	not used~~n/a~~
50	2.0%	not used~~n/a~~	3.0%
100	2.0%	not used~~n/a~~	not used~~n/a~~

~~Note:~~

~~All measurements in Tables S7.4.3.2 – S7.4.3.6 are to be referred to 25 degrees Celsius.~~

~~(a) The method for calculating the overall error is the vector sum of the errors of each component part (that is, a + b + c) where:~~

~~a = the error of the *voltage transformer* and wiring;~~

~~b = the error of the *current transformer* and wiring; and~~

~~c = the error of the *meter*.~~

~~(b) If compensation is carried out then the resultant *metering data* error shall be as close as practicable to zero.~~

Commented [AEMO18]: **Note:** Repositioned as a lead-in to the section – important for the reader to understand the information prior to the table presentation

S7.4.4 Check metering

(a) *Check metering* is to be applied in accordance with the following Table:

Metering Installation Type in accordance with Table S7.2.3.1	Check Metering Requirements
1	*Check metering installation*
2	Partial *check metering*
3	No requirement
4, 4A, 5 and 6	No requirement

(b) A *check metering installation* involves either:

(1) the provision of a separate *metering installation* using separate *current transformer* cores and separately fused *voltage transformer* secondary circuits, preferably from separate secondary windings: or

(2) if in *AEMO's* absolute discretion it is considered appropriate, in the case of a *metering installation* located at the *facility* at one end of the *two-terminal link*, a *metering installation* located at the *facility* at the other end of a *two-terminal link*.

(c) Where the *check metering installation* duplicates the *metering installation* and accuracy level, the average of the two validated data sets will be used to determine the *energy* measurement.

(d) Partial *check metering* involves the use of other *metering data* or operational data available to *AEMO* in 30 min electronic format as part of a validation process in accordance with the *metrology procedure*.

(e) The physical arrangement of partial *check metering* shall be agreed between the *Metering Coordinator* and *AEMO*.

(f) *Check metering installations* may be supplied from secondary circuits used for other purposes and may have a lower level of accuracy than the *metering installation*, but must not exceed twice the level prescribed for the *metering installation*.

S7.4.5 Resolution and accuracy of displayed or captured data

Programmable settings available within a *metering installation* or any peripheral device, which may affect the resolution of displayed or stored data, must:

(a) meet the requirements of the relevant *Australian Standards* and International Standards which must be identified in the *metrology procedure*; and

(b) comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Measurement Institute under the *National Measurement Act*.

S7.4.6 General design standards

S7.4.6.1 Design requirements

Without limiting the scope of detailed design, the following requirements must be incorporated in the design of each *metering installation*:

(a) For *metering installations* greater than 1000 GWh pa per *connection point*, the *current transformer* core and secondary wiring associated with the *meter*(s) shall not be used for any other purpose unless otherwise agreed by *AEMO*.

(b) For *metering installations* less than 1000 GWh pa per *connection point* the *current transformer* core and secondary wiring associated with the *meter*(s) may be used for other purposes (e.g. local *metering* or protection) provided the *Metering Coordinator* demonstrates to the satisfaction of *AEMO* that the accuracy of the *metering installation* is not compromised and suitable

procedures/measures are in place to protect the security of the *metering installation*.

(c) Where a *voltage transformer* is required, if separate secondary windings are not provided, then the *voltage* supply to each *metering installation* must be separately fused and located in an accessible position as near as practical to the *voltage transformer* secondary winding.

(d) Secondary wiring must be by the most direct route and the number of terminations and links must be kept to a minimum.

(e) The incidence and magnitude of burden changes on any secondary winding supplying the *metering installation* must be kept to a minimum.

(f) *Meters* must:

(1) meet the requirements of relevant *Australian Standards* and International Standards which must be identified in the *metrology procedure*; and

(2) have a valid pattern approval issued under the authority of the National Measurement Institute or, until relevant pattern approvals exist, a valid type test certificate.

(g) New *instrument transformers* must:

(1) meet the requirements of relevant *Australian Standards* and International Standards which must be identified in the *metrology procedure*; and

(2) have a valid pattern approval issued under the authority of the National Measurement Institute or, until relevant pattern approvals exist, a valid type test certificate.

(h) Suitable *isolation* facilities are to be provided to facilitate testing and calibration of the *metering installation*.

(i) Suitable drawings and supporting information, detailing the *metering installation*, must be available for maintenance and auditing purposes.

S7.4.6.2 Design guidelines

In addition to the above design requirements, the following guidelines should be considered for each *metering installation*:

(a) The provision of separate secondary windings for each *metering installation* where a *voltage transformer* is required.

(b) A *voltage* changeover scheme where more than one *voltage transformer* is available.

Schedule 7.5 Requirements of minimum services specification

S7.5.1 Minimum services specification

A *metering installation* meets the *minimum services specification* if it:

(a) subject to paragraph (d), is capable of providing the services listed in table S7.5.1.1 in accordance with the procedures made under clause 7.8.3;

(b) is connected to a *telecommunications network* which enables remote access to the *metering installation*;

(c) achieves the maximum allowable overall error (±%) at rates not exceeding the rates set out in table S7.4.3.4; and

(d) in relation to a *metering installation* that is connected to a *current transformer*, is capable of providing the services listed in items (c) to (f) in table S7.5.1.1 in accordance with procedures made under clause 7.8.3.

Table S7.5.1.1 Minimum Services Specification – services and access parties

1.	Service	2. Description	3. Access Party
(a)	remote *disconnection* service	The remote *disconnection* of a *small customer's* premises via the *metering installation*.	*Local Network Service Provider* *financially responsible Market Participant*
(b)	remote *reconnection* service	The remote *reconnection* of a *small customer's* premises via the *metering installation*.	*Local Network Service Provider* *financially responsible Market Participant* *Incoming Retailer*
(c)	remote on-demand *meter* read service	The remote retrieval of *metering data* including quality flags for a specified point or points in time and the provision of such data to the requesting party. The service includes the retrieval and provision of: • *reactive energy metering data* and/or *active energy metering data* (for imports and/or exports of *energy* measured by the *meter*); • *interval metering data* and cumulative total *energy* measurement for the *metering installation*; and • *accumulated metering data* at the start and the end of the period specified in the request.	*Registered Participants* with a financial interest in the *metering installation* or the *energy* measured by that *metering installation* A person to whom a *small customer* has given its consent under clause 7.15.4(b)(3)(ii)

1.	Service	2. Description	3. Access Party
(d)	remote scheduled *meter* read service	The remote retrieval of *metering data* including quality flags on a regular and ongoing basis and the provision of such data to the requesting party. The service includes the retrieval and provision of: • *reactive energy metering data* and/or *active energy metering data* (for imports and/or exports of *energy* measured by the *meter*); • *interval metering data* and cumulative total *energy* measurement for the *metering installation*; and • *accumulated metering data* at the start and the end of the period specified in the request.	*Registered Participants* with a financial interest in the *metering installation* or the *energy* measured by that *metering installation* A person to whom a *small customer* has given its consent under clause 7.15.4(b)(3)(ii)
(e)	*metering installation* inquiry service	The remote retrieval of information from, and related to, a specified *metering installation* and the provision of such information to the requesting party. The *metering installation* must be capable of providing the following information, as a minimum, when requested: • the status of the switch used to effect the *disconnection* and *reconnection* services; • the *voltage* as measured by the *metering installation*, with a date and *time stamp* for that reading; • the current as measured by the *metering*	*Local Network Service Provider* *financially responsible Market Participant* A person to whom a *small customer* has given its consent under clause 7.15.4(b)(3)(ii)

1. Service	2. Description	3. Access Party
	installation, with a date and *time stamp* for that reading; • the power (watts) as measured by the *metering installation*, with a date and *time stamp* for that reading; • the supply frequency (Hertz) as measured by the *metering installation*, with a date and *time stamp* for that reading; • the average *voltage* and current over a nominated *trading interval* for one or more nominated *trading intervals*; and • events that have been recorded in *meter* log (or logs) including recorded information in the tamper detection alarm, reverse energy flow alarm and *metering* device temperature alarm.	
(f) advanced *meter* reconfiguration service	The remote setting of the operational parameters of the *meter*. The operational parameters that must be capable of being set are, as a minimum, the following: • the activation or deactivation of a data stream or data streams; and • altering the method of presenting *energy data* and associated	*Local Network Service Provider* *financially responsible Market Participant*

1. Service	2. Description	3. Access Party
	information on the *meter* display.	

Schedule 7.6 Inspection and Testing Requirements

S7.6.1 General

(a) The *Metering Coordinator* must ensure that equipment comprised in a purchased *metering installation* has been tested to the required class accuracy with less than the uncertainties set out in Table S7.6.1.1.

(b) The *Metering Coordinator* must ensure appropriate test certificates of the tests referred to in paragraph (a) are retained.

(c) The *Metering Coordinator* (or any other person arranging for testing) must ensure that testing of the *metering installation* is carried out:

(1) in accordance with clause 7.9.1 and this Schedule 7.6; or

(2) in accordance with an asset management strategy that defines an alternative testing practice (other than time based) determined by the *Metering Coordinator* and approved by *AEMO*,

and:

(3) in accordance with a test plan which has been registered with *AEMO*;

(4) to the same requirements as for new equipment where equipment is to be recycled for use in another site; and

(5) so as to include all data storage and processing components included in the *metrology procedure*, including algorithms used to prepare agreed *load* patterns.

(d) *AEMO* must review the prescribed testing requirements in this Schedule 7.6 every 5 years in accordance with equipment performance and industry standards.

(e) The testing intervals may be increased if the equipment type/experience proves favourable.

(f) The maximum allowable level of testing uncertainty (±) for all *metering* equipment must be in accordance with Table S7.6.1.1.

Table S7.6.1.1 Maximum Allowable Level of Testing Uncertainty (±)

Description		Metering Equipment Class				
		Class 0.2	Class 0.5	Class 1.0	General Purpose	Class 2.0
In Laboratory	CTs ratio phase	0.05% 0.07 crad	0.1% 0.15 crad	n/a	n/a	n/a

Description		Metering Equipment Class				
		Class 0.2	Class 0.5	Class 1.0	General Purpose	Class 2.0
	VTs ratio Phase	0.05% 0.05 crad	0.1% 0.1 crad	n/a	n/a	n/a
	Meters Wh	0.05/cosφ%	0.1/cosφ%	0.2/cosφ%	0.2/cosφ%	n/a
	Meters varh	n/a	0.2/sinφ%	0.3/sinφ%	n/a	0.4/sinφ%
In Field	CTs ratio Phase	0.1% 0.15 crad	0.2% 0.3 crad	n/a	n/a	n/a
	VTs ratio Phase	0.1% 0.1 crad	0.2% 0.2 crad	n/a	n/a	n/a
	Meters Wh	0.1/cosφ%	0.2/cosφ%	0.3/cosφ%	0.3/cosφ%	n/a
	Meters varh	n/a	0.3/sinφ%	0.4/sinφ%	n/a	0.5/sinφ%

Where cosφ is the *power factor* at the test point under evaluation.

Table S7.6.1.2 Maximum Period Between Tests

Unless the *Metering Coordinator* has developed an asset management strategy that defines practices that meet the intent of this Schedule 7.6 and is approved by *AEMO*, the maximum period between tests must be in accordance with this Table S7.6.1.2.

Description	Metering Installation Type				
	Type 1	Type 2	Type 3	Type 4 & 4A	Types 5 & 6
CT	10 years	10 years	10 years	10 years	10 years
VT	10 years	10 years	10 years		n/a
Burden tests	When *meters* are tested or when changes are made				
CT connected Meter (electronic)	5 years	5 years	5 years	5 years	5 years
CT connected Meter (induction)	2.5 years	2.5 years	5 years	5 years	5 years
Whole current Meter	The testing ~~and inspection~~ requirements must be in accordance with an asset management strategy. Guidelines for the development of the asset management strategy must be recorded in the *metrology procedure*.				

Commented [AEMO19]: Table S7.6.1.2 Maximum Period Between Tests
Since Table S7.6.1.2 refers to "Maximum Period Between Tests" and Table S7.6.1.3 refers to "Period Between Inspections", AEMO has moved the inspection requirements to the below table for clarity and ease of reading.

Table S7.6.1.3 Period Between Inspections

Unless the *Metering Coordinator* has developed an asset management strategy that meets the intent of this Schedule 7.6 and is approved by *AEMO*, the period between inspections must be in accordance with this Table S7.6.1.3.

Description	Metering Installation Type			
	Type 1	Type 2	Type 3	Type 4, 4A, 5 & 6
Metering installation equipment inspection (other than whole current)	2.5 years	12 months (2.5 years if *check metering installation* installed)	~~> 210 GWh:~~ 2.5 years ~~2≤ GWh ≤ 10: 3 years~~ ~~<2 GWh: when *meter* is tested.~~	~~When *meter* is tested.~~5 years
Whole current *metering installation*	The inspection requirements must be in accordance with an asset management strategy. Guidelines for the development of the asset management strategy must be recorded in the *metrology procedure*.			

S7.6.2 Technical Guidelines

(a) *Current transformer* and *voltage transformer* tests are primary injection tests or other testing procedures as approved by *AEMO*.

(b) The calculations of accuracy based on test results are to include all reference standard errors.

(c) An "estimate of testing uncertainties" must be calculated in accordance with the ISO "Guide to the Expression of Uncertainty for Measurement".

(d) Where operational *metering* is associated with *settlements metering* then a shorter period between inspections is recommended.

(e) For sinφ and cosφ refer to the ISO "Guide to the Expression of Uncertainty in Measurement", where cosφ is the *power factor*.

(f) A typical inspection may include:

(1) check the seals;

(2) compare the pulse counts;

(3) compare the direct readings of *meters*;

(4) verify *meter* parameters and physical connections; and

(5) *current transformer* ratios by comparison.

Commented [AEMO22]: Inspection requirements for Type 4, 4A, 5 & 6 metering installations
The inspection requirements are proposed to be aligned with the requirements for testing in Table S7.6.1.2 above. The section in this table is rightly specific to CT connected metering installations only; all type 4, 4A, 5 and 6 whole current connected metering installations are covered by the proposed addition to the table, below (and consistent with the current wording in table S7.6.1.2). These proposals do not limit Metering Coordinators from developing an asset management strategy as provided for in the lead-in section to this table.

Commented [AEMO20]: Table S7.6.1.3 Period Between Inspections
Proposal to simplify the table and to reflect standard industry practice.

Commented [AEMO21]: Simplification of requirements for Type 3 metering installations
The requirements have been simplified to both reflect current market practice and to remove ambiguity. This proposal does not limit Metering Coordinators from developing an asset management strategy as provided for in the lead-in section to this table.

Commented [AEMO23]: Table S7.6.1.3 Period Between Inspections
Addition to provide clarity in alignment with corrections proposed to Table S7.6.1.2.

Schedule 7.7 Embedded Network Managers

S7.7.1 General

(a) An *Embedded Network Manager* must be accredited and registered by *AEMO*.

(b) *AEMO* must establish a qualification process for *Embedded Network Managers* that enables accreditation and registration to be achieved in accordance with the requirements of this schedule 7.7.

(c) An *Embedded Network Manager* must ensure that *embedded network management services* are carried out in accordance with the *Rules* and procedures authorised under the *Rules*.

S7.7.2 Capabilities of Embedded Network Managers

Embedded Network Managers must be able to exhibit to the reasonable satisfaction of *AEMO* the following capabilities:

(a) detailed understanding of the *Rules* including this Chapter 7, and all procedures authorised under the *Rules* including the *ENM service level procedures*.

(b) detailed understanding of:

(1) the terms and conditions on which the *AER* grants exemptions under section 13 of the *National Electricity Law* to persons who engage in the activity of owning, controlling or operating *embedded networks*; and

(2) any related guidelines developed and issued by the *AER* under clause 2.5.1.

(c) detailed understanding of the participant role relationships and obligations that exist between *Embedded Network Managers*, *Metering Data Providers*, *Metering Providers*, *financially responsible Market Participants*, *Local Network Service Providers*, *AEMO* and *Metering Co-ordinators*.

(d) the establishment of a system which will:

(1) underpin all operational documentation, processes and procedures;

(2) facilitate good change control management of procedures, IT systems and software;

(3) provide audit trail management of *EN wiring information*;

(4) maintain security controls and data integrity; and

(5) maintain knowledge and understanding of the *Rules* and relevant procedures, standards and guides authorised under the *Rules*.

(e) understanding of the required logical interfaces necessary to support the provision of *embedded network management services* including the interfaces needed to:

(1) access *AEMO's* systems; and

(2) support the *metrology procedure*, *B2B Procedures*, *service level procedures*, *ENM service level procedures* and *Market Settlement and Transfer Solution Procedures*.

10. Glossary

rated load

A *rated load* is:

(a) for a *connection point* metered with an *instrument transformer*, the rating of the *current transformer* tap-selected.

(b) for a whole current *meter*, the value of the current in accordance with which the relevant performance of the *meter* is fixed (i.e. the basic current).

Commented [AEMO24]: Rated load definition

"Rated load" is a term that is currently used in various tables in clause S7.3.4 but a definition is not given in the NER. To improve clarity, AEMO proposes that this term should be defined and has offered a definition for the AEMC's consideration.