7A. **Metering**

**Note**

Chapter 7A applies in substitution for Chapter 7 (which establishes the metering framework that applies in the other participating jurisdictions). Chapter 7A operates as a transitional framework until Chapter 7 takes effect in this jurisdiction.

Criteria for assessing when the transition to Chapter 7 will take effect will be considered as part of the phased implementation of the Rules in this jurisdiction.

The application of requirements in Chapter 7A relating to market and institutional arrangements will also be considered as part of the phased implementation of the Rules in this jurisdiction.

---

### Part A Introduction

#### 7A.1 Introduction to the Metering Chapter

**7A.1.1 Purpose and application**

This Chapter provides the framework for metering for local electricity systems by establishing the requirements for metering installations at connection points on transmission networks or distribution networks.

**7A.1.2 Contents**

This Chapter sets out provisions relating to:

(a) roles and responsibilities of financially responsible participants, *Metering Coordinators, NTESMO* and the *Utilities Commission* relating to metering;
(b) the appointment of, and the qualifications and requirements applying to, *Metering Providers* and *Metering Data Providers*;
(c) the appointment of *Metering Coordinators*;
(d) *metering installation requirements*;
(e) *metering data services* and the *metering database*;
(f) *metering register* requirements, the disclosure of *NMI* information, and the provision of *metering data* to *retail customers*;
(g) security of, and rights to access, *metering installations*, services provided by *metering installations*, *energy data* held in *metering installations* and *metering data* from *metering installations*; and
(h) relevant *metering procedures*.

**7A.1.3 Definitions**

In this Chapter:

*actual meter reading* means the collection of energy data from a metering installation by local access or remote acquisition.

*data stream* means a stream of metering data associated with a *connection point*, as represented by a *NMI*. A *NMI* may have multiple data streams (for example, from one or more *meters*, or one or more channels or registers that comprise a
single meter). Each data stream is identified by a unique suffix associated with the NMI to which it belongs.

**financially responsible participant** means a person who is financially responsible for a connection point.

**MDFF Specification** means the Metering Data File Format Specification NEM 12 and NEM 13, published by AEMO, with an effective date of 1 December 2017 (Version 1.06).

**Metering Data File Format** means metering data that is in a form that complies with the MDFF Specification.

**metering provision services** means the provision, installation and maintenance of metering installations.

**prepayment device** means a metering installation that requires a prepayment for the supply of electricity prior to consumption.

**scheduled meter reading** means an actual meter reading performed in accordance with the usual reading cycle for the meter.

**special meter reading** means an actual meter reading performed outside of the usual reading cycle for the meter.

**vending services** means, for a metering installation at a connection point that is a prepayment device, services that allow the financially responsible participant to sell electricity that will flow through the prepayment device in the future for consumption, and to receive payment in advance for selling that electricity.

**Note**

The following are examples of vending services:

(a) services for prepayments made by credit card through a website or app, or over the telephone;

(b) services for prepayments made in person by cash or credit card to purchase a physical token or unique code that must be entered into a prepayment device.

### 7A.1.4 Inconsistency

(a) If there is an inconsistency between substantive Chapter 7A and the schedules to this Chapter, substantive Chapter 7A prevails to the extent of the inconsistency.

(b) In this clause:

**substantive Chapter 7A** means this Chapter other than the schedules to this Chapter.

**Note**

To the extent that there is an inconsistency between the Rules and the National Measurement Act, the Act prevails to the extent of the inconsistency: see Rule 1.7.1A.

### Part B Roles and Responsibilities

### 7A.2 Role and responsibility of financially responsible participant

(a) Before participating in a market in respect of a connection point, and for so long as the financially responsible participant continues to participate in a
market, the financially responsible participant for a connection point must ensure that:

1. a Metering Coordinator is appointed in respect of the connection point in accordance with Part C of this Chapter;
2. the connection point has a metering installation and information about the metering installation is provided to NTESMO for inclusion on the metering register, where this is required by clause 7A.10.1;
3. a NMI has been obtained with respect to the connection point; and
4. if information about the metering installation is required to be provided to NTESMO for inclusion on the metering register by clause 7A.10.1, the NMI is obtained prior to that information being provided to NTESMO.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) NTESMO may refuse to permit a financially responsible participant to participate in a market in respect of a connection point used for the purposes of settlements if the financially responsible participant is not compliant with its obligation under paragraph (a) with respect to the connection point.

(c) Where, following a request made by a financially responsible participant in accordance with clause 7A.6.14, the metering installation at a connection point is a prepayment device, the financially responsible participant is responsible for ensuring that an arrangement for vending services is in place.

7A.3 Role and responsibility of Metering Coordinator

7A.3.1 Responsibility of the Metering Coordinator

For the term of its appointment in respect of a connection point, the Metering Coordinator is the person responsible for:

(a) the provision, installation and maintenance of a metering installation at the connection point in accordance with Part D of this Chapter;
(b) the collection of metering data with respect to the metering installation, the processing of that data, the retention of that data in the metering data services database and the delivery of that data to the metering database and other persons in accordance with Part E of this Chapter; and
(c) managing the security of and access to:
   1. the metering installation;
   2. services provided by the metering installation;
   3. energy data held in the metering installation; and
   4. metering data from the metering installation, in accordance with Part F of this Chapter.
7A.3.2 Role of the Metering Coordinator

Appointment of a Metering Provider

(a) The Metering Coordinator at a connection point, other than a connection point with a type 7 metering installation, must appoint a person who is accredited to provide metering provision services in this jurisdiction to be the Metering Provider to provide metering provision services for the connection point.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

Appointment of a Metering Data Provider

(b) The Metering Coordinator at a connection point must appoint a person who is accredited to provide metering data services in this jurisdiction to be the Metering Data Provider to provide metering data services for the connection point.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

Metering installations

(c) The Metering Coordinator at a connection point, other than a connection point with a type 7 metering installation, must ensure that:

(1) the metering installation is provided, installed and maintained in accordance with the Rules;

(2) the components, accuracy and testing of the metering installation comply with the requirements of the Rules;

(3) the security control of the metering installation is provided in accordance with rule 7A.13;

(4) if remote acquisition is used or is to be used – a communications interface is installed and maintained to facilitate connection to the telecommunications network;

(5) NTESMO is provided (when requested) with any information required for the purposes of Schedule 7A.1 for any new or replacement metering installation or any altered metering installation; and

(6) the Metering Provider it appoints for the connection point complies with the obligations imposed on Metering Providers by this Chapter.

(d) A Metering Coordinator must not prevent, hinder or otherwise impede the Local Network Service Provider from locally accessing a metering installation or connection point for the purposes of reconnecting or disconnecting the connection point.
Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

Metering data services
(e) The Metering Coordinator at a connection point must:
   (1) ensure that the Metering Data Provider it appoints for the connection point complies with the obligations imposed on Metering Data Providers by this Chapter;
   (2) ensure that metering data services are provided in accordance with the Rules; and
   (3) arrange for the provision of relevant metering data to the Metering Data Provider if remote acquisition, if any, becomes unavailable.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

Access to type 4 metering installations
(f) The Metering Coordinator at a connection point with a type 4 metering installation:
   (1) must ensure that access to the metering installation, the services provided by the metering installation and energy data held in the metering installation is only granted to persons entitled to access the metering installation, or the services provided by the metering installation or energy data held in the metering installation, in accordance with this Chapter;
   (2) must not arrange a disconnection except:
      (i) on the request of the financially responsible participant or Local Network Service Provider;
      (ii) where the disconnection is effected via remote access; and
      (iii) in accordance with jurisdictional electricity legislation;
   (3) must not arrange a reconnection except:
      (i) on the request of the financially responsible participant, Local Network Service Provider or incoming retailer;
      (ii) where the reconnection is effected via remote access; and
      (iii) in accordance with jurisdictional electricity legislation; and
   (4) must not arrange a retailer planned interruption of the supply of electricity at the metering installation except:
      (i) on the request of the retailer; and
      (ii) in accordance with jurisdictional electricity legislation.
7A.4 Qualification and requirements of Metering Providers and Metering Data Providers

7A.4.1 Qualification and requirements of Metering Providers

(a) This clause applies in respect of the 1st regulatory control period.

Note
The application of this clause in respect of subsequent regulatory control periods will be considered as part of the phased implementation of the Rules in this jurisdiction.

(b) A Metering Provider must have an ISO 9000 series quality system in place.

(c) For a connection point in respect of which a type 1, 2 or 3 metering installation is installed, or is required to be installed under this Chapter:

(1) the Local Network Service Provider is taken to be accredited to provide metering provision services in this jurisdiction (including the services mentioned in the schedules in respect of which a Metering Provider requires accreditation); and

(2) the Metering Coordinator at the connection point is taken to have appointed the Local Network Service Provider as the Metering Provider for the connection point.

(d) For a connection point in respect of which a type 4, 4A, 5 or 6 metering installation is installed, or is required to be installed under this Chapter:

(1) the Local Network Service Provider is taken to be accredited to provide metering provision services in this jurisdiction (including the services mentioned in the schedules in respect of which a Metering Provider requires accreditation); and

(2) the Metering Coordinator at the connection point is taken to have appointed the Local Network Service Provider as the Metering Provider for the connection point.

(e) A Metering Provider may, in providing metering provision services under this Chapter, contract with another person to assist it in the provision of those services, provided that person meets all relevant safety and technical requirements in any applicable regulatory instruments or other relevant law.

7A.4.2 Qualification and requirements of Metering Data Providers

(a) This clause applies in respect of the 1st regulatory control period.

Note:
The application of this clause in respect of subsequent regulatory control periods will be considered as part of the phased implementation of the Rules in this jurisdiction.

(b) A Metering Data Provider must have an ISO 9000 series quality system in place.

(c) For a connection point in respect of which a type 1, 2 or 3 metering installation is installed, or is required to be installed under this Chapter:
(1) the Local Network Service Provider is taken to be accredited to provide metering data services in this jurisdiction (including the services mentioned in the schedules in respect of which a Metering Data Provider requires accreditation); and

(2) the Metering Coordinator at the connection point is taken to have appointed the Local Network Service Provider as the Metering Data Provider for the connection point.

(d) For a connection point in respect of which a type 4, 4A, 5, 6 or 7 metering installation is installed, or is required to be installed under this Chapter:

(1) the Local Network Service Provider is taken to be accredited to provide metering data services in this jurisdiction (including the services mentioned in the schedules in respect of which a Metering Data Provider requires accreditation); and

(2) the Metering Coordinator at the connection point is taken to have appointed the Local Network Service Provider as the Metering Data Provider for the connection point.

(e) A Metering Data Provider may, in providing metering data services under this Chapter, contract with another person to assist it in the provision of those services, provided that person meets all relevant safety and technical requirements in any applicable regulatory instrument or other relevant law.

**Part C  Appointment of Metering Coordinator**

**7A.5  Appointment of Metering Coordinator**

(a) This rule applies in respect of the 1st regulatory control period.

Note:

The application of this rule in respect of subsequent regulatory control periods will be considered as part of the phased implementation of the Rules in this jurisdiction.

(b) For a connection point in respect of which a type 1, 2 or 3 metering installation is installed, or is required to be installed under this Chapter, the financially responsible participant for the connection point is taken to have appointed the Local Network Service Provider as the Metering Coordinator for the connection point.

(c) For a connection point in respect of which a type 4, 4A, 5 or 6 metering installation is installed, or is required to be installed under this Chapter, the financially responsible participant for the connection point is taken to have appointed the Local Network Service Provider as the Metering Coordinator for the connection point.

(d) For a connection point with a type 7 metering installation, the financially responsible participant for the connection point is taken to have appointed the Local Network Service Provider as the Metering Coordinator for the connection point.
Part D  Metering installation

7A.6  Metering installation arrangement

7A.6.1  Metering installation requirements

(a)  The Metering Coordinator at a connection point must ensure that there is a metering installation at that connection point.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b)  The Metering Coordinator at a connection point must ensure that energy data held in the metering installation is based on units of watthour (active energy) and where required varhour (reactive energy).

(c)  Installation and maintenance of a metering installation must be carried out in a safe manner, and only by a Metering Provider appointed under clause 7A.3.2.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.6.2  Metering installation components

(a)  A Metering Provider must, in accordance with the Rules, ensure that a metering installation, other than a type 7 metering installation:

(1)  contains a device that has either a visible or an equivalently accessible display of the cumulative total energy measured by that metering installation (at a minimum);

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(2)  is accurate in accordance with clause 7A.6.6;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(3)  in the case of a type 1, 2, 3 or 4 metering installation—has electronic data transfer facilities from the metering installation to the metering data services database;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(4)  includes a communications interface to meet the requirements of clause 7A.3.2(c)(4);
Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(5) is secure in accordance with rule 7A.9;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(6) records energy data in a manner that enables metering data to be collated in accordance with clause 7A.8.6;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(7) is capable of separately recording energy data for energy flows in each direction where bi-directional active energy flows occur or could occur;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(8) has a measurement element for active energy and, if required in accordance with schedule 7A.4, a measurement element for reactive energy, with both measurements to be recorded;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(9) includes facilities for storing interval energy data for a period of at least 35 days if the metering installation is a type 1, 2, 3 or 4 metering installation;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(10) includes facilities for storing interval energy data for a period of at least 200 days or such other period as specified in schedule 7A.7 if the metering installation is a type 4A or 5 metering installation;

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(11) in the case of a type 6 metering installation, includes facilities capable of continuously recording the total accumulated energy supplied
through it by a visible display in accordance with subparagraph (1), over a period of at least 12 months; and

**Note**

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(12) is suitable for the range of operating conditions to which it will be exposed (for example temperature or impulse levels) and operates within the defined limits for its components.

(b) A *metering installation* may consist of combinations of:

1. a current transformer;
2. a voltage transformer;
3. secure and protected wiring from the current transformer and the voltage transformer to the meter;
4. *communications interface* equipment such as a modem, isolation requirements, telephone service, radio transmitter and data link equipment;
5. auxiliary electricity supply to the meter;
6. an alarm circuit and monitoring facility;
7. a facility to keep the *metering installation* secure from interference;
8. test links and fusing;
9. summation equipment; and
10. several *metering points* to derive the *metering data* for a *connection point*.

(c) The *Local Network Service Provider* or financially responsible participant may, with the agreement of the *Metering Coordinator* (which agreement must not be unreasonably withheld), arrange for a *metering installation* to contain features which are in addition to, or which enhance, the features specified in paragraph (b).

(d) The financially responsible participant for a *connection point* must:

1. apply to the *Local Network Service Provider* for a *NMI*; and
2. provide the *Metering Coordinator* at the *connection point* with the *NMI* for the *metering installation* within 5 business days of receiving the *NMI* from the *Local Network Service Provider*.

(e) The *Local Network Service Provider* must:

1. issue a unique *NMI* for each *metering installation* on its *network* to the financially responsible participant; and
2. provide information about the *NMI* to *NTESMO*, where this is required for the purposes of clause 7A.10.1.
Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(f) The Metering Coordinator must ensure that NTESMO is provided with the relevant details of the metering installation as specified in Schedule 7A.1 within 10 business days of receiving the NMI under paragraph (d)(2), where this is required for the purposes of clause 7A.10.1.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(g) Where a metering installation is used for operational purposes in addition to metrological purposes, the Metering Coordinator must:

(1) use reasonable endeavours to ensure that there will be no infringement of the requirements of the Rules; and

(2) co-ordinate with the persons who use the metering installation for such other purposes.

7A.6.3 Emergency management

Note
Emergency management will be considered as part of the phased implementation of the Rules in this jurisdiction.

7A.6.4 Network devices

Note
Network devices will be considered as part of the phased implementation of the Rules in this jurisdiction.

7A.6.5 Metering point

(a) The Metering Coordinator at a connection point must ensure that:

(1) the metering point is located as close as practicable to the connection point, but is in a position that allows safe and unimpeded access to the metering installation by the Metering Provider, Metering Data Provider and any other person required or permitted to have access to the metering installation under the Rules or any other law; and

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(2) any instrument transformers required for a check metering installation are located in a position that achieves a mathematical correlation with the metering data.
7A.6.6 Metering installation types and accuracy

(a) The type of metering installation and the accuracy requirements for a metering installation are to be determined in accordance with schedule 7A.4.

Note
This Chapter 7A makes provision for type 7 metering installations and imposes requirements on type 7 metering installations, including obligations about calculating metering data. Those obligations will only apply in this jurisdiction in the event of a type 7 metering installation being available in this jurisdiction and after a 12 month transitional period allowing all participants to achieve compliance.

(b) A check metering installation is not required to have the degree of accuracy required of a metering installation but the Metering Coordinator must ensure that it has mathematical correlation with the metering installation and complies with the requirements of schedule 7A.4.

(c) The Metering Coordinator at a connection point must ensure that the accuracy of a type 6 metering installation is in accordance with regulations issued under the National Measurement Act or, in the absence of any such regulations, with schedule 7A.7.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.6.7 Functionality requirements for type 1, 2, 3 and 4 metering installations

(a) This clause applies in respect of a type 1, 2, 3 or 4 metering installation.

(b) The Metering Coordinator at a connection point must ensure that the metering installation complies with the functionality requirements specified in schedule 7A.5.

7A.6.8 Meter churn

(a) A Metering Coordinator may arrange to alter a type 5 or 6 metering installation to make it capable of remote acquisition if:

(1) the alteration is reasonably required to address operational difficulties; or

(2) the Metering Coordinator is the Local Network Service Provider and the alteration is reasonably required to enable the Local Network
Service Provider to meet its obligations to provide a safe, reliable and secure network.

(b) An alteration of a metering installation by a Metering Coordinator in accordance with paragraph (a) does not alter the classification of that installation to a type 4 or 4A metering installation.

(c) For paragraph (a)(1), operational difficulties arise if the metering installation is difficult or unsafe to access because:

1. It is on a remote property;
2. It is within a secure facility;
3. It is in close proximity to hazardous materials; or
4. Accessing or arranging access to it otherwise poses a risk to the safety and security of persons or property.

7A.6.9 Metering installation malfunctions

(a) Unless an exemption is obtained by the Metering Coordinator from NTESMO under this clause 7A.6.9, the Metering Coordinator must, if a metering installation malfunction occurs in respect of a connection point with a type 1, 2 or 3 metering installation, cause repairs to be made to the metering installation as soon as practicable but no later than 2 business days after the Metering Coordinator had been notified of the metering installation malfunction.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) Unless an exemption is obtained by the Metering Coordinator from NTESMO under this clause 7A.6.9, if a metering installation malfunction occurs, the Metering Coordinator must, in respect of a connection point with:

1. A type 4 metering installation – cause repairs to be made to the metering installation as soon as practicable but no later than 10 business days after the Metering Coordinator has been notified of the metering installation malfunction; or
2. A metering installation other than the installations mentioned in paragraph (a) or subparagraph (1) – cause repairs to be made to the metering installation as soon as practicable but no later than 10 business days after the Metering Coordinator has been notified of the metering installation malfunction.

(c) NTESMO must establish, maintain and publish a procedure applicable to the provision of exemptions for the purposes of paragraphs (a) and (b).

(d) If an exemption is provided by NTESMO under this clause 7A.6.9, then the Metering Provider must provide NTESMO with a plan for the rectification of the metering installation.
Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(e) A Registered Participant, Metering Provider or Metering Data Provider who becomes aware of a metering installation malfunction that cannot be rectified within the applicable timeframes as specified in paragraphs (a) and (b) must notify the Metering Coordinator of the metering installation malfunction within 1 business day.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.6.10 Timeframes for meters to be installed – new connection

(a) Subject to paragraph (b), where a new connection is requested at a retail customer's premises, the relevant retailer must arrange a meter to be installed:

(1) by a date agreed with the retail customer; or

(2) failing agreement with the retail customer, on a date no later than 6 business days from the date the retailer is informed that the connection service (as defined in clause 5A.A.1) is complete.

(b) The timeframe under paragraph (a)(1) or (2) (as applicable) will not apply where:

(1) the retail customer has not entered into an agreement with the retailer for the meter to be installed;

(2) the proposed site for the meter at the retail customer's premises is not accessible or safe or ready for the meter to be installed, or the connection service (as defined in clause 5A.A.1) has not been completed; or

(3) installing the meter requires interrupting supply to another retail customer.

(c) Subject to the reapplication of paragraph (b), on and from the date that an exception under paragraph (b) ceases to apply, the retailer must arrange for the meter to be installed:

(1) by a new date agreed with the retail customer; or

(2) failing agreement, on a date no later than 5 business days from the date that the exception ceases to apply.

(d) A retailer must inform its retail customers of its obligations under this clause.

7A.6.11 Timeframes for meters to be installed – where a connection service is not required

(a) Subject to paragraph (b), if a retail customer has requested the retailer to install a meter at the customer's premises and a connection service (as
defined in clause 5A.A.1) is not required, the retailer must arrange for the meter to be installed:

(1) by a date agreed with the retail customer; or

(2) failing agreement with the retail customer, on a date no later than 15 business days after the retailer received the request from the retail customer for the meter to be installed.

(b) The timeframe under paragraph (a)(1) or (2) (as applicable) will not apply where:

(1) the retail customer has not entered into an agreement with the retailer for the meter to be installed;

(2) the proposed site for the meter at the retail customer's premises is not accessible, safe, or ready for the meter to be installed; or

(3) installing the meter requires interrupting supply to another retail customer.

(c) Subject to the reapplication of paragraph (b), on and from the date that an exception under paragraph (b) ceases to apply, the retailer must arrange for the meter to be installed:

(1) by a new date agreed with the retail customer; or

(2) failing agreement, on a date no later than 15 business days from the date that the exception ceases to apply.

(d) For the avoidance of doubt, the timeframes for meters to be installed under this rule 7A.6.11 do not apply for a retailer initiated installation of a meter, or for a new connection.

(e) A retailer must inform its retail customers of its obligations under this clause.

7A.6.12 Timeframes for meters to be installed – where a connection alteration is required

(a) Subject to paragraph (b), if a retail customer has requested a meter to be installed at the customer's premises and a connection alteration is also required:

(1) the retailer must arrange for the meter to be installed:

   (i) by a date agreed with the retail customer and the Distribution Network Service Provider where the Distribution Network Service Provider is providing the connection alteration; or

   (ii) failing agreement, on a date no later than 15 business days after the retailer received the request from the retail customer for the meter to be installed; and

(2) where a Distribution Network Service Provider is providing the connection alteration, the Distribution Network Service Provider must co-ordinate the connection alteration, with the retailer and other relevant parties, in order to allow the retailer to comply with its obligation under subparagraph (1).
(b) The timeframe under paragraph (a)(1) (i) or (ii) (as applicable) will not apply where:
    (1) the retail customer has not entered into an agreement with the retailer for the meter to be installed;
    (2) the proposed site for the meter at the retail customer's premises is not accessible, safe, or ready for the meter to be installed;
    (3) installing the meter requires interrupting supply to another retail customer;
    (4) the retail customer has not met the conditions that it is required to comply with under its connection contract; or
    (5) augmentation is required for the purposes of the connection alteration and has not yet been completed.

c) Subject to the reapplication of paragraph (b), on and from the date that an exception under paragraph (b) ceases to apply:
    (1) the retailer must arrange for the meter to be installed:
        (i) by a new date agreed with the retail customer and the Distribution Network Service Provider where the Distribution Network Service Provider is providing the connection alteration; or
        (ii) failing agreement, on a date no later than 15 business days from the date that the exception ceases to apply; and
    (2) where a Distribution Network Service Provider is providing the connection alteration, it must co-ordinate the connection alteration, with the retailer and other relevant parties, in order to allow the retailer to meet its obligation under subparagraph (1).

d) If the retailer receives a request from a retail customer for a meter to be installed at the customer's premises where a connection alteration is also required, the retailer must inform the Distribution Network Service Provider of the request no later than the next business day after receiving the request.

e) For the avoidance of doubt, the timeframes for meters to be installed under this rule 7A.6.12 do not apply for a retailer initiated installation of a meter, or for a new connection.

(f) A retailer must inform its retail customers of its obligations under this clause.

7A.6.13 Changing a metering installation

(a) Subject to this clause, nothing in these Rules prevents the financially responsible participant (on its own behalf or, in the case of a retailer, on its own behalf or on behalf of a retail customer) or Network Service Provider in respect of a connection point from requesting the Metering Coordinator to arrange for:
    (1) the alteration of the metering installation at that connection point; or
(2) the installation of a new metering installation at that connection point.

(b) The incremental costs of the alteration of the metering installation or the installation of the new metering installation must be borne by the person who requests the alteration of the metering installation or the installation of the new metering installation.

(c) The Metering Coordinator at a connection point must ensure that changes to parameters or settings within a metering installation are:

(1) implemented by a Metering Provider; and

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(2) confirmed by the Metering Coordinator within 2 business days after the alteration has been made; and

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(3) reported to NTESMO where required to enable NTESMO to record the changes in the metering register in accordance with clause 7A.10.2.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.6.14 Prepayment metering

(a) This clause applies if, in accordance with clause 7A.6.13, the financially responsible participant in respect of a connection point requests the Metering Coordinator to arrange for:

(1) the alteration of a metering installation so that it is a prepayment device; or

(2) the installation of a new metering installation that is a prepayment device.

(b) The Metering Coordinator must ensure that the Metering Provider:

(1) alters the metering installation so that it is a prepayment device, if so requested; or

(2) installs a new metering installation that is a prepayment device, if so requested.

7A.7 Maintenance, inspection, testing and auditing of metering installations

7A.7.1 Maintenance

The Metering Coordinator for a connection point must ensure that any maintenance (including inspection and testing) of a metering installation at the
connection point is carried out in a safe manner by an appropriately qualified person.

### 7A.7.2 Responsibility for inspection and testing

(a) The Metering Coordinator for a connection point must ensure that any inspection or testing of a metering installation at the connection point is carried out in a safe manner by an appropriately qualified person.

(b) A person who arranges or carries out an inspection or testing of a metering installation under this clause must do so in accordance with:

1. this clause; and
2. the relevant inspection and testing requirements set out in schedule 7A.6.

**Note**

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(c) A Registered Participant may request that the Metering Coordinator make arrangements for the testing of a metering installation and, if the request is reasonable, the Metering Coordinator:

1. must not refuse the request; and
2. must make arrangements for the testing.

(d) The Registered Participant who requested the testing under paragraph (c) may make a request to the Metering Coordinator to witness the tests.

(e) The Metering Coordinator must not refuse a request received under paragraph (d) and must, no later than 5 business days prior to the testing, advise:

1. the party making the request; and
2. the financially responsible participant, of:
3. the location and time of the tests; and
4. the method of testing to be undertaken.

**Note**

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(f) If the Metering Coordinator has arranged testing of a metering installation under this clause and schedule 7A.6, the Metering Coordinator must:

1. inform the financially responsible participant that testing has been undertaken in respect of the metering installation in accordance with this clause; and
2. make the test results available in accordance with paragraphs (g) and (h).
(g) If the test results mentioned in paragraph (f) indicate deviation from the technical requirements for the metering installation, the Metering Coordinator must ensure that the test results are provided as soon as practicable to the persons who receive the metering data for the metering installation under clause 7A.8.4.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(h) If the test results mentioned in paragraph (f) indicate compliance with the technical requirements for the metering installation, the Metering Coordinator must ensure that the test results are provided as soon as practicable:

(1) in circumstances where the tests were requested by a Registered Participant, to the Registered Participant and persons who receive the metering data for the metering installation under clause 7A.8.4; or

(2) to a Registered Participant if requested by that Registered Participant, if the tests are not the result of a request for testing.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(i) The Utilities Commission may check the test results recorded in the metering register by arranging for audits of metering installations to satisfy itself and NTESMO that the accuracy of each metering installation complies with the requirements of this Chapter 7A.

(j) The Metering Coordinator must store the test results in accordance with clause 7A.7.7 and provide a copy to the Utilities Commission on request or as part of an audit.

(k) The cost of any testing under paragraph (c) must be borne by:

(1) if paragraph (g) applies – the Metering Coordinator; or

(2) otherwise – the Registered Participant who requested the test.

7A.7.3 Actions in event of non-compliance

(a) If the accuracy of the metering installation does not comply with the requirements of the Rules, the Metering Coordinator must:

(1) advise NTESMO as soon as practicable of the errors detected and the possible duration of the existence of the errors;

(2) arrange for the accuracy of the metering installation to be restored within:

(i) 10 business days; or

(ii) if a timeframe is agreed with the financially responsible participant, in that timeframe; and
(3) correct the metering data and provide the corrected metering data to NTESMO.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) NTESMO may make appropriate corrections to the metering data to take account of errors referred to it under paragraph (a) for the purposes of settlements.

7A.7.4 Audits of information held in metering installations

(a) The Utilities Commission is responsible for auditing metering installations.

(b) A Registered Participant or NTESMO may request the Utilities Commission to conduct an audit to determine the consistency between the data held in the metering database and the data held in the relevant metering installation.

(c) If there are inconsistencies between data held in a metering installation and data held in the metering database, the Metering Coordinator and Registered Participants with a financial interest in the metering installation or the energy measured by the metering installation must liaise together to determine the most appropriate way to resolve the discrepancy.

(d) If there are inconsistencies between data held in a metering installation and data held in the metering database, the data held in the metering installation is to be taken as prima facie evidence of the connection point's energy data, except if the meter or components of the metering installation are found to be non-compliant with the Rules.

(e) The cost of any audit conducted under paragraph (b) will be borne by:
(1) if paragraph (c) applies, the Metering Coordinator; or
(2) otherwise, the Registered Participant who requested the audit or NTESMO, as the case may be.

7A.7.5 Appointment of external auditor

(a) The Utilities Commission may, upon reasonable notice to the Metering Coordinator, appoint an independent auditor to audit metering installations to confirm compliance with the Rules.

(b) If the Utilities Commission appoints an independent auditor under paragraph (a):
(1) the Utilities Commission will nominate the standards and requirements and the auditor will report in accordance with those standards and requirements; and
(2) the Metering Coordinator must cooperate with any reasonable requests made by the independent auditor in undertaking the audit.

(c) The Utilities Commission will provide a copy of the auditor's report to:
(1) the Metering Coordinator;
(2) NTESMO; and
(3) the relevant financially responsible participant, as soon as reasonably possible after it has been completed.

(d) The Metering Coordinator must ensure that the Utilities Commission (or its agents) have unrestricted access to metering installations for the purpose of carrying out external audits provided that the Utilities Commission agrees to comply with the Metering Coordinator's reasonable security and safety requirements and has first given the Metering Coordinator at least 2 business days notice of its intention to carry out an audit.

(e) A notice under paragraph (d) must include:

(1) the name of the representative who will be conducting the audit on behalf of the Utilities Commission; and
(2) the time when the audit will commence and the expected time when the audit will conclude.

(f) The Metering Coordinator will be responsible for the costs of undertaking the audit.

7A.7.6 Errors found in metering tests, inspections or audits

(a) Subject to paragraph (c), if a metering installation test, inspection or audit, carried out in accordance with this rule, demonstrates errors in excess of those prescribed in schedule 7A.4, the Metering Coordinator must ensure the metering data is substituted in accordance with this clause and clause 7A.8.1 as appropriate.

(b) If the Metering Coordinator is not aware of the time at which the error arose:

(1) the error is taken to have occurred at a time halfway between the time of the most recent test or inspection which demonstrated that the metering installation complied with the relevant accuracy requirement and the time when the error was detected; and
(2) the time that the error was taken to occur is to be used by the Metering Data Provider in performing substitution of the metering data.

(c) If a test of a metering installation demonstrates an error of measurement of less than 1.5 times the error permitted by schedule 7A.4, no substitution of readings is required.

(d) The Metering Coordinator must arrange for a suitable substation of the incorrect metering data to be undertaken in accordance with the substitution requirements of schedule 7A.7.

7A.7.7 Retention of test records and documents

(a) All records and documentation of tests prepared under or for this Chapter must be retained in accordance with this clause.

(b) The Metering Coordinator must ensure records and documentation are retained as follows:

(1) for a period of at least 7 years:
(i) sample testing of meters while the meters of the relevant style remain in service;
(ii) the most recent sample test results of the meters mentioned in subparagraph (i) after the meters are no longer in service;
(iii) non-sample testing of meters while the meters remain in service;
(iv) the most recent non-sample test results after the meters are no longer in service;
(v) the most recent sample test results of instrument transformers after instrument transformers of the relevant type are no longer in service;
(vi) the most recent non-sample test results of instrument transformers after they are no longer in service;
(vii) tests of new metering equipment of the relevant style while the equipment remains in service; and
(viii) tests of new metering equipment of the relevant style after the equipment is no longer in service;

(2) for a period of at least 10 years:

(i) sample testing of instrument transformers while instrument transformers of the relevant type remain in service; and
(ii) non-sample testing of instrument transformers while the instrument transformers remain in service.

(c) In addition, the Metering Coordinator must ensure records of type tests and pattern approvals carried out or obtained in accordance with clause S7A.4.5.1(f) are retained while metering equipment of the relevant type remains in service and for at least 7 years after it is no longer in service.

Part E Metering data

7A.8 Metering data services

7A.8.1 Metering data services

(a) Metering Data Providers must provide metering data services, including the following, in accordance with the Rules:

(1) collecting energy data by local access or remote acquisition;
(2) the validation and substitution of metering data for types 1, 2, 3 and 4 metering installations;
(3) the validation, substitution and estimation of metering data for types 4A, 5 and 6 metering installations;
(4) the calculation, estimation and substitution of metering data for type 7 metering installations;
(5) establishing and maintaining a metering data services database associated with each metering installation and providing access to the metering data services database in accordance with clause 7A.8.3;
(6) the delivery of metering data and relevant NT NMI Data for a metering installation in accordance with clause 7A.8.4;

(7) the delivery to NTESMO of the following for settlements:

(i) metering data;

(ii) any metering register data requested by NTESMO;

(8) the delivery to relevant financially responsible participants of metering data for billing transactions;

(9) ensuring the metering data and other data associated with the metering installation is kept secure and disclosed only in accordance with the Rules;

(10) maintaining the standard of accuracy of the time setting of the metering installation in accordance with clause 7A.8.8;

(11) notifying the Metering Coordinator of any metering installation malfunction in accordance with clause 7A.6.9;

(12) management and storage of metering data in accordance with clause 7A.8.3; and

(13) in respect of a metering installation that is a prepayment device, subject to paragraph (b), services required to support the energisation and de-energisation of the metering installation.

(b) Metering Data Providers are not responsible:

(1) for the provision of a prepayment device; or

(2) in relation to a metering installation that is a prepayment device, unless there is an agreement with the financially responsible participant to the contrary, for the provision of vending services.

Note
The installation of prepayment devices is dealt with in clause 7A.6.14.
The provision of vending services for prepayment devices is dealt with in rule 7A.2.

(c) Metering Data Providers may provide additional data services that exceed the minimum requirements of the Rules at the request of a relevant financially responsible participant provided that:

(1) the full cost of providing such additional data services is met by the financially responsible participant; and

(2) the provision of additional data services does not affect the provision of metering data services.

Note
For example, vending services for a prepayment device could be an additional service, if the financially responsible participant arranges for them to be provided by the Metering Data Provider, noting that in accordance with clause 7A.2(c) the financially responsible participant is responsible for ensuring that an arrangement for vending services is in place.

7A.8.2 Collection of energy data and estimation of metering data

(a) A Metering Data Provider must, in accordance with this rule, collect energy data from, and estimate metering data in respect of, a metering installation
at a connection point for which it has been appointed the Metering Data Provider.

Scheduled meter reading

(b) The Metering Data Provider must use reasonable endeavours to ensure that energy data is collected from a metering installation by way of an actual meter reading at least once every 3 months or, where a greater frequency has been agreed with a financially responsible participant, at that greater frequency.

(c) Despite paragraph (b), the Metering Data Provider must ensure that energy data is collected from a metering installation by way of an actual meter reading at least once every 12 months.

Special meter reading

(d) The Metering Data Provider must perform a special meter reading (including a final meter reading) at the request of a financially responsible participant.

(e) The Metering Data Provider may charge the financially responsible participant or retail customer(as the case may be) for the collection of energy data under paragraph (d) to the extent that its costs of collection are higher than they would otherwise be.

Estimated metering data

(f) When energy data is not collected by the Metering Data Provider from a metering installation by way of an actual meter reading at the applicable meter reading frequency under paragraph (b), the Metering Data Provider must estimate metering data for that metering installation in accordance with schedule 7A.7.

(g) Estimated metering data for the purposes of paragraph (f) must be provided to the retailer within 10 business days of the scheduled meter reading date under paragraph (b).

Altering energy data

(h) The energy data in a metering installation must not be altered except when the metering installation is reset to zero as part of a repair or reprogramming.

7A.8.3 Data management and storage

(a) A Metering Data Provider must:

(1) retain metering data for all relevant metering installations in the metering data services database:

(i) in electronic format for at least 13 months; and

(ii) following the retention under subsubparagraph (i), in an accessible format for at least 7 years;

(2) archive, in an accessible format, for at least 7 years:
(i) metering data in its original form as collected from the metering installation; and
(ii) records of each substitution to metering data in respect of a metering installation;

(3) enable the persons mentioned in clause 7A.13.5(c)(1) to (6) to access or receive the metering data and NT NMI data in the metering data services database; and

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(4) except for the persons mentioned in clause 7A.13.3(c)(1) to (6), ensure that no person has access to the metering data services database.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) A Metering Data Provider must maintain electronic data transfer facilities in order to deliver metering data from the metering data services database in accordance with schedule 7A.8 and clause 7A.8.4.

(c) Check metering data, where available, and appropriately adjusted for differences in metering installation accuracy, where applicable, must be used by the Metering Data Provider to validate metering data.

(d) If the Metering Data Provider becomes aware that the metering data that has been delivered into the metering database from a metering data services database is incorrect, then the Metering Data Provider must provide corrected metering data to the financially responsible participant and NTESMO within 1 business day of detection.

(e) Metering data may only be altered by a Metering Data Provider, except in the preparation of settlements ready data, in which case NTESMO may alter the metering data in accordance with clause 7A.9.2(c).

(f) A Metering Data Provider may only alter metering data in the metering data services database in accordance with schedule 7A.7.

(g) A Metering Data Provider must arrange with the Metering Coordinator to obtain the relevant metering data if remote acquisition, if any, becomes unavailable.

(h) A Metering Data Provider’s rules and protocols for supplying metering data services must be approved by NTESMO and NTESMO must not unreasonably withhold such approval.

7A.8.4 Provision of metering data to certain persons

A Metering Data Provider must give metering data and relevant NT NMI data to the persons mentioned in clause 7A.13.5(c)(1) to (6) and clause 9A.13.5(g)(1) as required by, and in accordance with, the Rules.
7A.8.5 Use of check metering data

Check metering data, if available and if it has been appropriately adjusted for differences in metering installation accuracy, must be used by Metering Data Providers or NTESMO, as the case may be, for:

(a) validation;
(b) substitution; and
(c) estimation,

of metering data as required by clause 7A.8.1.

7A.8.6 Periodic energy metering

(a) Subject to paragraph (b), a Metering Data Provider must:

(1) for type 1, 2, 3, 4, 4A and 5 metering installations, collate metering data relating to:

   (i) the amount of active energy; and
   (ii) reactive energy (where relevant) passing through a connection point,

   in recording intervals within a metering data services database; and

(2) for type 6 metering installations, collate accumulated energy data relating to an interval of up to 3 months.

(b) However:

(1) in relation to paragraph (a)(1):

   (i) for local electricity systems with a market administered by NTESMO— it may be agreed between NTESMO and the financially responsible participant that metering data may be recorded in sub-multiples of a recording interval where a metering installation is used for the purposes of settlements; and
   (ii) for local electricity systems without a market administered by NTESMO – it may be agreed between the Metering Coordinator and the financially responsible participant that metering data may be recorded in sub-multiples of a recording interval where a metering installation is used for the purposes of billing transactions; and

(2) in relation to paragraph (a)(2):

   (i) for local electricity systems with a market administered by NTESMO— it may be agreed between NTESMO and the financially responsible participant that some other period will apply either on an ongoing basis or once-off basis; and
   (ii) for local electricity systems without a market administered by NTESMO – it may be agreed between the Metering Coordinator

Note

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)
and the financially responsible participant that some other period will apply either on an ongoing basis or once-off basis.

(c) A Metering Data Provider must, for type 7 metering installations, prepare estimated metering data relating to the amount of active energy passing through a connection point in accordance with clause 7A.8.1(a)(4) in 3 months or, where a greater frequency has been agreed with a financially responsible participant, at that greater frequency within a metering data services database.

7A.8.7 Verification of metering data Metering installations other than type 7 metering installations

(a) A Metering Data Provider responsible for a metering installation, other than a type 7 metering installation, must ensure that the metering data collected from the installation is validated in accordance with schedule 7A.7.

(b) If validation under paragraph (a) demonstrates that there has been a failure of the metering installation or that a measurement error exists:

(1) the metering data must be substituted in accordance with schedule 7A.7;

(2) the Metering Data Provider must provide the quality flag of the substituted metering data to the financially responsible participant for its record in accordance with clause 7A.7.8.4; and

(3) for connection points associated with a retail customer– the Metering Data Provider must provide the substituted metering data to the retailer so that the retailer can meet its billing obligations.

(c) The Metering Data Provider:

(1) must make a separate record of any substitution made under this clause, including:

(i) the reasons for the substitution;

(ii) the methodology used for the substitution; and

(iii) the substituted metering data; and

(2) must maintain the record for at least 7 years and provide access to the record at reasonable times to the relevant financially responsible participant or retail customer (as the case may be).

Type 7 metering installations

Note

Obligations relating to type 7 metering installations, including requirements for calculating metering data under this clause, will only apply in this jurisdiction in the event of a type 7 metering installation being available in this jurisdiction and after a 12 month transitional period allowing all participants to achieve compliance.

(d) A Metering Data Provider responsible for a type 7 metering installation must ensure that the metering data for that installation:
(1) is calculated in accordance with the Network Service Provider's applicable procedure, which must be based on a methodology in, or otherwise be consistent with, schedule 7A.7; and

(2) is validated in accordance with schedule 7A.7.

(e) If validation under paragraph (d)(2) demonstrates that there has been a failure of the metering installation or that a measurement error exists, the Metering Data Provider must ensure the metering data is substituted in accordance with schedule 7A.7.

7A.8.8 Time settings

(a) The Metering Provider must set the times of clocks of all metering installations with reference to Australian Central Standard Time to a standard of accuracy in accordance with schedule 7A.4 relevant to the load through the connection point when installing, testing and maintaining metering installations.

(b) NTESMO must ensure that the metering database clock is maintained within ±1 second of Australian Central Standard Time.

(c) The Metering Data Provider must ensure that the metering data services database clock is maintained within ±1 second of Australian Central Standard Time.

(d) The Metering Data Provider must:

(1) check the accuracy of the clock of the metering installation with reference to Australian Central Standard Time to a standard of accuracy in accordance with schedule 7A.4 relevant to the load through the connection point on each occasion that the metering installation is accessed;

(2) reset the clock of the metering installation so that it is maintained to the required standard of accuracy in accordance with schedule 7A.4 relevant to the load through the connection point if the clock error of a metering installation does not conform to the required standard of accuracy on any occasion that the metering installation is accessed; and

(3) notify the Metering Provider if the Metering Data Provider is unable to reset the clock of the metering installation in accordance with subparagraph (2).

7A.8.9 Metering data performance standards

(a) Where required for the purposes of settlements, the Metering Coordinator must ensure that metering data is provided to NTESMO for all recording intervals where the metering installation has the capability for remote acquisition of metering data, and that the data is:

(1) derived from a metering installation compliant with clause 7A.6.5(a);

(2) provided within the timeframe for settlements required in accordance with jurisdictional electricity legislation;

(3) actual or substituted in accordance with schedule 7A.7; and
(4) provided in accordance with the performance standards specified in schedule 7A.7.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) Where:

(1) the metering installation is a type 4A metering installation, or does not have the capability for remote acquisition of metering data; and

(2) metering data is required for the purposes of settlements,

the Metering Coordinator must ensure that metering data is provided to NTESMO and that the data is:

(3) derived from a metering installation compliant with clause 7A.6.5(a);

(4) provided within the timeframe required for settlements in accordance with jurisdictional electricity legislation;

(5) actual, substituted or estimated in accordance with schedule 7A.7; and

(6) provided in accordance with the performance standards specified in schedule 7A.7.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(c) The Metering Coordinator must ensure that, for all metering installations used for billing transactions, metering data is provided to the financially responsible participant for all recording intervals where the metering installation has the capability for remote acquisition of metering data, and that the data is:

(1) derived from a metering installation compliant with clause 7A.6.5(a);

(2) provided to the financially responsible participant every 35 days for billing transactions unless it has been agreed between the Metering Coordinator and the financially responsible participant that some other timeframe will apply;

(3) actual or substituted in accordance with schedule 7A.7; and

(4) provided in accordance with the performance standards specified in schedule 7A.7.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(d) For type 6 metering installations, metering data relating to the amount of active energy passing through a connection point must be provided to the financially responsible participant:

(1) every 3 months; or
(2) where a greater frequency has been agreed with the financially responsible participant – at that greater frequency.

7A.9 Metering data and database

7A.9.1 Metering database

(a) \textit{NTESMO} must create, maintain and administer a \textit{metering database} (either directly or under a contract for provision of the database) containing information for each \textit{metering installation} registered with \textit{NTESMO}.

(b) The \textit{metering database} must include \textit{metering data}, \textit{settlements ready data}, and information for each \textit{metering installation} registered with \textit{NTESMO} in accordance with this rule 7A.9.

(c) \textit{NTESMO}:

(1) must enable the persons referred to in clause 7A.13.5(c)(1) to (4) and clause 7A.13.5(f)(1) to access or receive data in the \textit{metering database}; and

(2) except as specified in subparagraph (1), must ensure that no other person has access to the \textit{metering database}.

(d) For all types of \textit{metering installations}, the \textit{metering database} must contain \textit{metering data} that is:

(1) retained in an electronic format for at least 13 months; and

(2) following the retention under subparagraph (1), archived in an accessible format for an overall period of not less than 7 years.

(e) The \textit{settlements ready data} held in the \textit{metering database} must be used by \textit{NTESMO} for \textit{settlement purposes}.

(f) The \textit{settlements ready data} held in the \textit{metering database} may be used by \textit{Distribution Network Service Providers} for the purpose of determining \textit{distribution service charges} in accordance with clause 6.20.1.

(g) \textit{NTESMO} must retain \textit{settlements ready data} for all \textit{metering installations} for at least 7 years.

(h) Despite anything to the contrary in this \textit{Rule}, \textit{NTESMO} may provide the \textit{energy ombudsman} with \textit{metering data} relating to a \textit{Registered Participant} from a \textit{metering installation}, the \textit{metering database}, or the \textit{metering register}, if the \textit{energy ombudsman} has received a complaint to which the data is relevant from a \textit{retail customer} of the \textit{Registered Participant}.

(i) \textit{NTESMO} must notify the relevant \textit{Registered Participant} of any information requested by the \textit{energy ombudsman} under paragraph (h) and, if it is requested by that \textit{Registered Participant}, supply the \textit{Registered Participant} with a copy of any information provided to the \textit{energy ombudsman}.
7A.9.2 Data validation, substitution and estimation

(a) If NTESMO in the preparation of settlements ready data detects metering data that fails validation NTESMO must notify the Metering Data Provider within 1 business day of detection.

(b) Where a Metering Data Provider receives notification under paragraph (a), the Metering Data Provider must use its best endeavours to provide corrected metering data to NTESMO within 1 business day or advise NTESMO that this time limit cannot be achieved, and the reason for delay, in which case the parties must agree on a revised time limit by which the corrected metering data will be provided.

(c) Where metering data fails validation by NTESMO in the preparation of settlements ready data and replacement metering data is not available within the time required for settlements then NTESMO must prepare a substitute value in accordance with schedule S7A.7.

7A.9.3 Changes to energy data or to metering data

(a) The Metering Coordinator must ensure that energy data held in a metering installation is not altered except when the meter is reset to zero as part of a repair or reprogramming.

(b) If an on-site test of a metering installation requires the injection of current, the Metering Coordinator must ensure that:

(1) the energy data stored in the metering installation is inspected;

(2) if necessary following the inspection under subparagraph (1), alterations are made to the metering data, to ensure that the metering data in the metering data services database and the metering database is not materially different from the energy consumed at that connection point during the period of the test.

(c) If a Metering Coordinator considers alterations are necessary under paragraph (b)(2), the Metering Coordinator must:

(1) for local electricity systems with a market operated by NTESMO, notify NTESMO that alteration to the metering data is necessary; and

(2) advise the financially responsible participant of the need to change the metering data, and the Metering Coordinator must arrange for the Metering Data Provider to:

(i) alter the metering data for the connection point held in the metering data services database in accordance with the validation, substitution and estimation procedures in schedule 7A.7; and

(ii) provide the altered metering data to the persons who receive that metering data under clause 7.13.5(c).

(d) If a test referred to in paragraph (b) is based on actual connection point loads, no alteration is required.
Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.10 Register of metering information

7A.10.1 Metering register
(a) As part of the metering database, NTESMO must maintain a metering register of all metering installations and check metering installations which provide metering data for settlements.
(b) The metering register referred to in paragraph (a) must contain the information specified in Schedule 7A.1.

7A.10.2 Metering installation registration process
(a) For the purpose of maintaining the metering register, NTESMO must establish, maintain and publish a registration process in respect to the following (where metering data provided is used for settlements):
   (1) new metering installations;
   (2) modifications to existing metering installations; and
   (3) decommissioning of metering installations.
(b) For the 1st regulatory control period, if information about a metering installation is included in the metering register, then the metering installation is to be, taken, for the purposes of this Chapter 7A, to be registered with NTESMO.

7A.10.3 Metering register discrepancy
(a) If the information in the metering register indicates that the metering installation or the check metering installation does not comply with the requirements of the Rules, NTESMO must advise affected Registered Participants of the discrepancy.
(b) The Metering Coordinator must arrange for the discrepancy to be corrected within 2 business days of receipt of notification under paragraph (a) unless otherwise agreed by NTESMO.

Discrepancies between database and other data
(c) If there is a discrepancy between energy data held in a metering installation and data held in the metering database:
   (1) the affected Metering Coordinator and NTESMO must liaise together to determine the most appropriate way to resolve the discrepancy; and
   (2) for the purposes of this Chapter the energy data for the metering point in the metering installation is to be taken to be correct, unless it is proven to be incorrect.
(d) If there is a discrepancy between information held in a metering register and the same category of information in any other database, then for the
purposes of this Chapter the information recorded in the metering register is to be taken to be correct, unless it is proven to be incorrect.

**Metering Coordinators must keep the registry accurate**

(e) If a Metering Coordinator becomes aware of a change to, or an inaccuracy in, information in the metering register, then it must as soon as practicable and no later than 2 business days after the day it becomes aware of the change or inaccuracy notify NTESMO and provide details of the change to, or inaccuracy in, the information.

**NTESMO may amend metering register**

(f) If NTESMO is notified of an inaccuracy in information by a Metering Coordinator or other Registered Participant in relation to the connection point it is financially responsible for, NTESMO must undertake investigations to the standard of good industry practice to determine whether the metering register should be updated.

(g) If NTESMO determines that the metering register should be updated as a result of an investigation conducted in accordance with paragraph (a), NTESMO must update the registry to reflect the change to, or correct the inaccuracy in, the information.

(h) If information for a connection point is updated in the metering register, NTESMO must, within 2 business days after the update, notify the update to:

(1) the financially responsible participant; and

(2) if the financially responsible participant is a retailer and there was a change in retailer, the previous retailer where that updated information relates to a period or periods when the previous retailer was the retailer for that connection point.

**Note**

In paragraph (h)(2), references to “previous retailer” means a retailer who was previously recorded in the metering register as the financially responsible participant for the connection point referred to in paragraph (h).

**7A.11 Disclosure of information**

**7A.11.1 Provision of data to retailers**

**NMI and NMI checksum**

(a) A Distribution Network Service Provider must, at the request of a retailer, and within 1 business day of the date of the request, provide the retailer with the NMI and NMI checksum for premises identified in the request by reference to:

(1) a unique meter identifier held by the Distribution Network Service Provider;

(2) a street address; or

(3) the code used by Australia Post to provide a unique identifier for postal addresses.
(b) If a computer search by the Distribution Network Service Provider does not produce a unique match for the information provided by the retailer, the Distribution Network Service Provider must provide the retailer with any computer matches achieved up to a maximum of 99.

**NT NMI Data**

(c) A Distribution Network Service Provider must, at the request of a retailer, and within 2 business days of the date of the request, provide the retailer with the NT NMI Data for premises identified in the request by reference to the NMI for the premises.

### 7A.12 Metering data provision to retail customers

**Note**

The application of this rule will be revisited as part of the phased implementation of the Rules in this jurisdiction.

### Part F Security of metering installations and energy data

#### 7A.13 Security of metering installations, energy data and metering data

**7A.13.1 Confidentiality of data**

(a) Energy data, metering data, NT NMI data, information in the metering register and passwords are confidential and must be treated as confidential information in accordance with the Rules.

(b) For the purposes of clause 8.6.2(c), metering data from a metering installation at a retail customer's connection point is deemed to have been provided by the retail customer.

#### 7A.13.2 Security of metering installations

**General security**

(a) The Metering Coordinator at a connection point must ensure that the metering installation is secure and that associated links, circuits and information storage and processing systems are protected by appropriate security mechanisms.

**Note**

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) In respect of a connection point used for settlements, NTESMO may override any of the security mechanisms fitted to a metering installation with prior notice to the Metering Coordinator.

**Broken seals**

(c) If a Network Service Provider, financially responsible participant, Metering Provider or Metering Data Provider becomes aware that a seal protecting
metering equipment has been broken, it must notify the Metering Coordinator within 5 business days.

(d) If a broken seal has not been replaced by the person who notified the Metering Coordinator under paragraph (c), the Metering Coordinator must ensure that the broken seal is replaced no later than:

1. the first occasion on which the metering equipment is visited to take a reading; or
2. 100 days,

after receipt of notification that the seal has been broken.

(e) The costs of replacing broken seals as required by paragraph (d) are to be borne by:

1. the financially responsible participant if the seal was broken by a retail customer of the financially responsible participant;
2. a Registered Participant if the seal was broken by the Registered Participant;
3. the Metering Provider if the seal was broken by the Metering Provider;
4. the Metering Data Provider if the seal was broken by the Metering Data Provider; or
5. otherwise by the Metering Coordinator.

(f) If it appears that, as a result of, or in connection with, the breaking of a seal mentioned in paragraph (c) the relevant metering equipment may no longer meet the relevant minimum standard, the Metering Coordinator must ensure that the metering equipment is tested in accordance with clause 7A.7.2.

7A.13.3 Security controls for energy data

(a) The Metering Coordinator at a connection point must ensure that energy data held in the metering installation is protected from local access and remote access by suitable password and security controls.

**Note**
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(b) The Metering Provider must keep records of passwords secure.

**Note**
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

(c) The Metering Provider must allocate suitable passwords to the Metering Data Provider to enable the Metering Data Provider to collect the energy data and maintain the clock of the metering installation in accordance with clause 7A.8.7.
(d) The *Metering Data Provider* must keep all *metering installation* passwords secure and not make the passwords available to any other person.

**Note**

This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

### 7A.13.4 Additional security controls for type 4 metering installations

In respect of a type 4 *metering installation*:

(a) the *Metering Coordinator* must ensure that access to *energy data* held in the *metering installation* is given only:

1. to a person who is permitted to have access to it under the *Rules*; and
2. for a purpose that is permitted under the *Rules*;

(b) the *Metering Coordinator* must ensure that access to services provided by the *metering installation* and *metering data* from the *metering installation* is given only:

1. in respect of:
   
   
   
   (i) a remote *disconnection* service and the *metering data* in connection with that service – to the *Local Network Service Provider* and the financially responsible participant;
   
   (ii) a remote *reconnection* service and the *metering data* in connection with that service – to the *Local Network Service Provider*, the financially responsible participant and the incoming *retailer*;
   
   (iii) a remote on-demand *meter* reading service and the *metering data* in connection with that service – to *Registered Participants* with a financial interest in the *metering installation* or the *energy* measured by that *metering installation* and a person to whom a *retail customer* has given its consent under subparagraph (3)(ii);
   
   (iv) a remote scheduled *meter* reading service and the *metering data* in connection with that service – to *Registered Participants* with a financial interest in the *metering installation* or the *energy* measured by that *metering installation* and a person to whom a *retail customer* has given its consent under subparagraph (3)(ii);
   
   (v) a *metering installation* inquiry service and the *metering data* in connection with that service – to the *Local Network Service Provider*, the financially responsible participant and a person to whom a *retail customer* has given its consent under subparagraph (3)(ii); and
   
   (vi) an advanced *meter* reconfiguration service and the *metering data* in connection with that service – to the *Local Network Service Provider* and the financially responsible participant;

2. to a person who is permitted to have access to it under the *Rules* and for a purpose that is permitted under the *Rules*; or
(3) except as otherwise specified in subparagraph (1) or (2):
   (i) to the Local Network Service Provider, but only to the extent
       that, in the Metering Coordinator's reasonable opinion, the
       access is reasonably required by the Local Network Service
       Provider to enable it to meet its obligations to provide a safe,
       reliable and secure network; or
   (ii) to a person and for a purpose to which the retail customer has
        given prior consent;

(c) the Metering Coordinator must ensure that the services provided by the
    metering installation are protected from local access and remote access by
    suitable password and security controls in accordance with paragraph (e);

(d) the Metering Provider must keep records of passwords secure; and

(e) the Metering Provider must:
   (1) forward a copy of a password allowing local access and a copy of a
       password allowing remote access to the metering installation, services
       provided by the metering installation and energy data held in the
       metering installation, to the Metering Coordinator, Metering Data
       Provider and NTESMO; and
   (2) ensure that no other person receives or has access to a copy of a
       password allowing local access or remote access to the metering
       installation, services provided by the metering installation or energy
       data held in the metering installation.

Note
This provision is classified as a civil penalty provision under the National Electricity (NT) Regulations. (See regulation 6(1) and Schedule 1 of the National Electricity (NT) Regulations.)

7A.13.5 Access to data

(a) Access to energy data recorded by a metering installation must only be
    given if passwords are allocated in accordance with clause 7A.13.3.

(b) The Metering Coordinator must ensure that access to energy data from the
    metering installation is scheduled appropriately to ensure that congestion
does not occur.

(c) Subject to this clause, the only persons entitled to access or receive metering
    data, settlements ready data, NT NMI data or data from the metering
    register for a metering installation are:

   (1) the financially responsible participant in respect of the connection
       point for the metering installation and any other Registered
       Participant with a financial interest in the metering installation or the
       energy measured by the metering installation;
   (2) the Metering Coordinator appointed in respect of the connection point
       for the metering installation;
   (3) the Metering Provider appointed with respect to the metering
       installation;
(4) the Metering Data Provider appointed with respect to the metering installation;

(5) NTESMO and its authorised agents;

(6) the Local Network Service Provider associated with the connection point; and

(7) the AER and the Utilities Commission.

(d) In addition to the persons mentioned in paragraph (c), the following persons may access or receive metering data in accordance with the Rules:

(1) a retail customer or customer authorised representative, upon request by that retail customer or its customer authorised representative to the retailer or Distribution Network Service Provider in relation to that retail customer's metering installation;

(2) the energy ombudsman.

(e) A retailer or Distribution Network Service Provider must, upon request by a retail customer or its customer authorised representative under paragraph (d)(1), provide information about the retail customer's energy consumption for the previous 2 years.

(f) Without limiting this clause:

(1) a retailer is entitled to access or receive NT NMI data;

(2) a customer authorised representative may receive metering data; and

(3) a retailer or a Distribution Network Service Provider may access or receive metering data or provide metering data to a customer authorised representative,

after having first done whatever may be required, if relevant, under any applicable privacy legislation and clause 7A.9.5 including, if appropriate, making relevant disclosures or obtaining relevant consents from retail customers.

(g) For the avoidance of doubt and without limiting this clause:

(1) a Metering Data Provider must provide relevant NT NMI data to a Distribution Network Service Provider to the extent that NT NMI data is required for the Distribution Network Service Provider to fulfil its obligations under this Chapter 7A of the Rules; and

(2) a Distribution Network Service Provider is authorised to, and must provide, relevant NT NMI data to a Metering Data Provider to the extent that NT NMI data is required for the Metering Data Provider to fulfil its obligations under this Chapter 7A of the Rules.

Schedule 7A.1 Metering register

S7A.1.1 General

The metering register forms part of the metering database and holds static metering information associated with metering installations defined by the Rules that determine the validity and accuracy of metering data.
S7A.2 Metering register information

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

(a) serial numbers;
(b) the metering installation identification name; and
(c) the information required to assign loss factors.

S7A.3 Communication guideline

(a) NTESMO must develop, maintain and publish a communication guideline in accordance with the Rules consultation procedures.
(b) A communication guideline must be in place at all times.
(c) The communication guideline is intended to set out specific details as to how metering and energy data and other information exchange processes will be implemented.
(d) The communication guideline must:
   (1) specify, or incorporate by reference, detailed technical specifications (including file formats, protocols and timeframes) as to how data and information communication is to be processed, and how the necessary information systems are to be designed and developed; and
   (2) be sufficient to enable a Registered Participant to design and commission the information systems necessary for it to engage in communications with NTESMO for the purposes of the Rules.
(e) The communication guideline may include types of metering information that must be included in the metering register.

Schedule 7A.2 Metering provider

Note

The detail of this schedule will be considered as part of the phased implementation of the Rules in this jurisdiction.

Schedule 7A.3 Metering data provider

Note

The detail of this schedule will be considered as part of the phased implementation of the Rules in this jurisdiction.

Schedule 7A.4 Types and accuracy of metering installations

S7A.4.1 General requirements

This schedule sets out the minimum requirements for metering installations.
### S7A.4.2 Accuracy requirements for metering installations

#### Table S7A.4.2.1 Overall accuracy requirements of metering installation components

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume limit per annum per connection point</th>
<th>Maximum allowable overall error (±%) at full load (Item 6)</th>
<th>Minimum acceptable class or standard of components</th>
<th>Metering installation clock error (seconds) in reference to ACST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Active</td>
<td>Reactive</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>greater than 1 000GWh</td>
<td>0.5</td>
<td>1.0</td>
<td>0.2CT/VT/meter Wh 0.5 meter varh</td>
</tr>
<tr>
<td>2</td>
<td>100 to 1 000GWh</td>
<td>1.0</td>
<td>2.0</td>
<td>0.5CT/VT/meter Wh 1.0 meter varh</td>
</tr>
<tr>
<td>3</td>
<td>0.75 to less than 100 GWh</td>
<td>1.5</td>
<td>3.0</td>
<td>0.5CT/VT 1.0 meter Wh 2.0 meter varh (Item 1)</td>
</tr>
<tr>
<td>4</td>
<td>less than 750 MWh (Item 2)</td>
<td>1.5</td>
<td>n/a</td>
<td>Either 0.5 CT and 1.0 meter Wh; or whole current general purpose meter Wh meets requirements of clause 7A.6.2(a)(9) and 7A.8.9(a) (Item 1)</td>
</tr>
<tr>
<td>4A</td>
<td>less than x MWh (Item 3)</td>
<td>1.5</td>
<td>3.0</td>
<td>Either 0.5 CT and 1.0 meter Wh; or whole current general purpose meter Wh meets requirements of clause 7A.6.2(a)(10) and 7A.8.9(b)</td>
</tr>
<tr>
<td>5</td>
<td>less than x MWh (Item 3)</td>
<td>1.5</td>
<td>n/a</td>
<td>Either 0.5 CT and 1.0 meter Wh; or whole current connected general purpose meter Wh meets requirements of clause 7A.6.2(a)(10) and 7A.8.9(b). (Item 1)</td>
</tr>
<tr>
<td>Type</td>
<td>Volume limit per annum per connection point</td>
<td>Maximum allowable overall error (±%) at full load (Item 6)</td>
<td>Minimum acceptable class or standard of components</td>
<td>Metering installation clock error (seconds) in reference to ACST</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------</td>
<td>---------------------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>active reactive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>less than y MWh (Item 4)</td>
<td>2.0 n/a</td>
<td>CT or whole current general purpose meter Wh recording accumulated energy data only. Processes used to convert the accumulated metering data into recording interval metering data and estimated metering data where necessary are included in schedule 7A.7. (Item 1)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>volume limit not specified (Item 5)</td>
<td>n/a</td>
<td>No meter. The metering data is calculated metering data determined in accordance with schedule 7A.7.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Item 1:  
(a) For a type 3, 4, 4A, 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 identified in schedule 7A.7.  
(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 voltage transformer and whose annual consumption is below 750 MWh, must meet the relevant accuracy requirements of Type 3 metering for active energy only.

Item 3: In relation to a type 4A and type 5 metering installation, the value of 'x' in this jurisdiction is 0 MWh per annum.

Item 4: The following requirements apply in relation to a type 6 metering installation:  
(1) the value of 'y' in this jurisdiction is 750 MWh per annum;
(2) devices within the metering installation may record accumulated energy data in predetermined daily time periods where such time periods are specified in schedule 7A.7.

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 a connection point if:

1. the operation of an unmetered device at the connection point results in a type of unmetered load that is authorised under the terms of a local instrument; and

2. NTESMO in consultation with Metering Coordinator determines:
   (i) that the load pattern is predictable;
   (ii) that, for the purposes of settlements, the load pattern can be reasonably calculated by a relevant method set out in schedule S7A.7; and
   (iii) that it would not be cost effective to meter the connection point taking into account:
       (A) the small magnitude of the load;
       (B) the connection arrangements; and
       (C) the geographical and physical location.

Note

The effect of paragraph (b) is that if a type of unmetered load is authorised under a local instrument, a connection point with that type of unmetered load may be used for the purposes of settlements, and be eligible for a type 7 metering installation, if NTESMO makes a determination under (b)(2) in relation to that connection point.

The National Electricity (Northern Territory) (National Uniform Legislation) (Modification) Regulations 2016 are an example of a local instrument.

(c) 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 Tables S7A.4.2.2 to S7A.4.2.6.
Table S7A.4.2.2 Type 1 installation – Annual energy throughput greater than 1,000 GWh

<table>
<thead>
<tr>
<th>% Rated Load</th>
<th>Power Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
</tr>
<tr>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>10</td>
<td>1.0%</td>
</tr>
<tr>
<td>50</td>
<td>0.5%</td>
</tr>
<tr>
<td>100</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Table S7A.4.2.3 Type 2 installation – Annual energy throughput between 100 and 1,000 GWh

<table>
<thead>
<tr>
<th>% Rated Load</th>
<th>Power Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
</tr>
<tr>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>10</td>
<td>2.0%</td>
</tr>
<tr>
<td>50</td>
<td>1.0%</td>
</tr>
<tr>
<td>100</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Table S7A.4.2.4 Type 3 installation – Annual energy throughput from 0.75 GWh to less than 100 GWh and Type 4A installation – annual energy throughput less than 0.75 GWh

<table>
<thead>
<tr>
<th>% Rated Load</th>
<th>Power Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
</tr>
<tr>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>10</td>
<td>2.5%</td>
</tr>
<tr>
<td>50</td>
<td>1.5%</td>
</tr>
<tr>
<td>100</td>
<td>1.5%</td>
</tr>
</tbody>
</table>
Table S7A.4.2.5 Type 4 or 5 installation – annual energy throughput less than 0.75 GWh

<table>
<thead>
<tr>
<th>% Rated Load</th>
<th>Power Factor</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
<td>0.866 lagging</td>
<td>0.5 lagging</td>
</tr>
<tr>
<td></td>
<td>Active</td>
<td>Active</td>
<td>Active</td>
</tr>
<tr>
<td>10</td>
<td>2.5%</td>
<td>2.5%</td>
<td>n/a</td>
</tr>
<tr>
<td>50</td>
<td>1.5%</td>
<td>1.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>100</td>
<td>1.5%</td>
<td>1.5%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Table S7A.4.2.6 Type 6 installation – annual energy throughput less than 0.75 GWh

<table>
<thead>
<tr>
<th>% Rated Load</th>
<th>Power Factor</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unity</td>
<td>0.866 lagging</td>
<td>0.5 lagging</td>
</tr>
<tr>
<td></td>
<td>Active</td>
<td>Active</td>
<td>Active</td>
</tr>
<tr>
<td>10</td>
<td>3.0%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>50</td>
<td>2.0%</td>
<td>n/a</td>
<td>3.0%</td>
</tr>
<tr>
<td>100</td>
<td>2.0%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Notes to Tables S7A4.2.2 to S7A4.2.6

All measurements in Tables S7A4.2.2 to S7A4.2.6 are to be referred to 24 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 must be as close as practicable to zero.

S7A.4.3 Check metering

(a) Where a check metering installation is in place, it is to be applied in accordance with the following Table:

<table>
<thead>
<tr>
<th>Metering Installation Type in accordance with Table S7A.4.2.1</th>
<th>Check Metering Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check metering installation</td>
</tr>
<tr>
<td>2</td>
<td>Partial check metering</td>
</tr>
</tbody>
</table>
### S7A.4.2.1 Metering Installation Type in accordance with Table S7A.4.2.1

<table>
<thead>
<tr>
<th>Metering Installation Type in accordance with Table S7A.4.2.1</th>
<th>Check Metering Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>No requirement</td>
</tr>
<tr>
<td>4, 4A, 5 and 6</td>
<td>No requirement</td>
</tr>
</tbody>
</table>

(b) Where a *check metering installation* is not in place, and a financially responsible participant requests the installation of a *check metering installation* at a connection point, the Metering Coordinator at the connection point must arrange for the installation of a *check metering installation* that complies with the requirements of this schedule.

(c) 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 NTESMO, in its absolute discretion, considers it 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*.

(d) Where the *check metering installation* duplicates the *metering installation* and accuracy level, the average of the 2 validated data sets will be used to determine the *energy measurement*.

(e) Partial *check metering* involves the use of other *metering data* or operational data available in 30 min electronic format as part of a validation process in accordance with Schedule 7A.7.

(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*.

(g) The physical arrangement of partial check metering will be determined by the *Metering Coordinator*.

### S7A.4.4 Resolution and accuracy of displayed or captured data

Programmable settings available within a *metering installation* of 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 specified in schedule 7A.7; and

(b) comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Measurement Institute under the *National Measurement Act*.
S7A.4.5 General design standards

S7A.4.5.1 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 1 000 GWh pa per connection point, the current transformer core and secondary wiring associated with the meter(s) must not be used for any other purpose;

(b) for metering installations less than 1 000 GWh pa per connection point, the current transformer core and secondary wiring associated with the meter(s) may be used for other purposes (for example, local metering or protection) provided the Metering Coordinator is able to demonstrate 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 (if any) specified in schedule 7A.7; 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 (if any) specified in schedule 7A.7; 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 purposes.

S7A.4.5.2 Design guidelines

In addition to the design requirements specified in clause S7A.5.1, 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 where more than one voltage transformer is available.

**Schedule 7A.5  Metering functionality requirements for type 1, 2, 3 and 4 metering requirements**

**S7A.5.1  Introduction**

**S7A.5.1.1  Purpose**

This schedule specifies the meter functionality requirements for type 1, 2, 3 and 4 metering installations in this jurisdiction.

**S7A.5.1.2  Definitions**

In this schedule:

- **communications network** means all communications equipment, processes and arrangements that lie between the meter and the NMS.

- **end user customer** means the customer or retail customer who consumes electricity at the point of use.

- **export** means the delivery of energy from the network to an end-use customer.

- **import** means the delivery of energy from an end-use customer into a distribution network.

- **local disconnection** means the operation of the supply contactor to effect a disconnection of supply performed locally at the meter by alternative electronic means.

- **metering system** means the installed metering installation, communications network or infrastructure, and any other systems required under this schedule.

- **NMS (Network Management System)** means the component of a metering system that manages the communications network.

- **remote disconnection** means the utilisation of the communication system to disconnect the end-use customer's supply at the meter by the operation of a contactor.

- **supply contactor** means the contactor in the meter that, when opened, causes the supply to be disconnected and, when closed, allows the supply to become connected.

- **total accumulated energy** means the total or accumulated amount of energy measured and recorded per channel of a meter since the installation of the meter or the resetting of the value.

**S7A.5.2  Functionality Requirements for Meters in Type 1, 2, and 3 metering installations**

**S7A.5.2.1  Application**

Clause S7A.5.2 applies to meters in type 1, 2 and 3 metering installations.
S7A.5.2.2 Applicable meter configurations

(a) The configuration for a meter must be:
   (1) three phase Low Voltage CT connect (excluding supply contactor); or
   (2) three phase CT/VT.

(b) Meters must meet the relevant requirements of AS 62052.11, AS 62053.22 and AS 62053.21, and any pattern approval requirements of the National Measurement Institute.

S7A.5.2.3 Metrology

Meters must comply with the following requirements:

(a) three phase meters must be four quadrant meters and must be able to separately record active energy and reactive energy, import and export in recording intervals;

(b) meters must record total accumulated energy for each recorded channel of interval data;

(c) the resolution for collection of interval energy data must be at least 0.1 kWh for active energy and 0.1 kVArh for reactive energy;

(d) meters must have a minimum storage of 35 days per channel of interval energy data;

(e) all channels of interval energy data must be able to be read locally as well as remotely read;

(f) it must be possible to remotely and locally select or configure whether import interval energy data is recorded or not;

(g) it must be possible to remotely and locally select or configure whether reactive energy interval energy data is recorded from three phase meters or not.

S7A.5.3 Functionality Requirements for Meters in Type 4 metering installations

S7A.5.3.1 Application

Clause S7A.5.3 applies to meters in type 4 metering installations.

S7A.5.3.2 Applicable meter configurations

(a) The configuration for a meter must be:
   (1) single phase, single element;
   (2) single phase, two element;
   (3) three phase direct connect; or
   (4) three phase CT connect (excluding supply contactor).

(b) Meters must meet the relevant requirements of AS 62052.11, AS 62053.22 and AS 62053.21, and any pattern approval requirements of the National Measurement Institute.
S7A.5.3.3 Metrology

Meters must comply with the following requirements:

(a) single phase meters must be two quadrant meters and must be able to separately record active energy for import and export in recording intervals;

(b) three phase meters must be four quadrant meters and must be able to separately record active energy and reactive energy, import and export in recording intervals;

(c) meters must record total accumulated energy data for each recorded channel of interval energy data;

(d) the resolution for collection of interval energy data must be at least 0.1 kWh for active energy and 0.1 kVArh for reactive energy;

(e) the resolution of energy consumption displayed on a meter's display must be at least 0.1 kWh and 0.1 kVArh for direct connected meters;

(f) meters must have a minimum storage of 200 days per channel of interval energy data;

(g) all channels of interval energy data must be able to be read locally as well as by remote acquisition;

(h) the values that must be recorded for import and export are the actual values at the connection point for direct connect meters;

(i) it must be possible to remotely and locally select or configure whether import interval energy data is recorded or not;

(j) it must be possible to remotely and locally select or configure whether reactive energy interval energy data is recorded from three phase meters or not.

Note:

Export is when energy is exported from the network to a customer and import is when the customer delivers energy into the network. See clause S7A5.1.2.

S7A.5.3.4 Remote and local reading of meters

(a) If a meter is remotely read:

   (1) the meter's total accumulated energy data per collected channel must be able to be collected once every 24 hours; and

   (2) the interval energy data per collected channel must be able to be collected once every 24 hours.

(b) If a meter is locally read, the meter's total accumulated energy per collected channel and the interval energy data per collected channel must be able to be collected.

(c) For individual reads of meters, it must be possible to select up to 35 days of interval energy data to be collected per channel.
S7A.5.3.5 Supply disconnection and reconnection

S7A.5.3.5.1 General requirements

(a) Meters excluding CT connected meters must have a supply contactor.

(b) Meters must support both local and remote disconnect, and local and remote reconnection of end-use customer supply via the supply contactor. When a meter performs a disconnection operation, all outgoing circuits from the meter must be disconnected.

(c) To confirm the current state of a meter, the meter must support "on-demand" remote polling of the meter to determine whether the supply contactor is open or closed.

(d) A meter must provide clear local visual indication of the status (open/closed) of the supply contactor.

S7A.5.3.5.2 Disconnection

(a) A meter must support both local and remote end-use customer supply disconnection functionality.

Local disconnection

Note:
The circumstances in which local disconnection may occur include where:

(a) a technician is already on-site performing works and it is most efficient for the technician to perform the disconnection; or

(b) a meter that is capable of remote reading is installed; however the communications infrastructure has not been rolled out or has failed.

(b) Local disconnection via the meter must only be able to be performed by an authorised technician. Unauthorised persons must be physically prevented from operating the supply contactor to disconnect supply.

(c) A meter must support the following:

(1) opening of the supply contactor performed locally;

(2) remote communication of the status (open/closed) of the supply contactor (if communications are active) from the meter to the NMS;

(3) event logging of the local disconnection at that meter.

Remote disconnection

(d) A meter must support the following:

(1) opening of the supply contactor performed remotely;

(2) remote communication of the status (open/closed) of the supply contactor (if communications are active) from the meter to the NMS;

(3) event logging of the remote disconnection at that meter.

S7A.5.3.5.3 Reconnection

(a) A meter must support both local and remote end-use customer supply reconnection functionality.
Local reconnection

(b) *Reconnection* via the meter must only be able to be performed locally by an authorised technician. Unauthorised persons must be physically prevented from operating the supply contactor to *reconnect supply*.

(c) A meter must support the following:

1. closing of the supply contactor performed locally;
2. remote communication of the status (open/closed) of the supply contactor (if communications are active) from the meter to the NMS;
3. event logging of local *reconnection* at that meter.

Remote reconnection

(d) A meter must support the following:

1. closing of the supply contactor performed remotely;
2. remote communication of the status (open/closed) of the supply contactor from the meter to the NMS; and
3. event logging of remote *reconnection*.

S7A.5.3.6 Time clock synchronisation

Date and time within meters must be maintained within 20 seconds of *Australian Central Standard Time*.

S7A.5.3.7 Quality of Supply and other event recording

(a) A meter must support the recording of Quality of Supply (QoS) events and other events that occur at each meter as detailed as follows:

<table>
<thead>
<tr>
<th>ID</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Import energy detected</td>
</tr>
<tr>
<td>2</td>
<td>Supply contactor opened – local</td>
</tr>
<tr>
<td>3</td>
<td>Supply contactor opened – remote</td>
</tr>
<tr>
<td>4</td>
<td>Supply contactor closed – local</td>
</tr>
<tr>
<td>5</td>
<td>Supply contactor closed – remote</td>
</tr>
<tr>
<td>6</td>
<td>Undervoltage event</td>
</tr>
<tr>
<td>7</td>
<td>Overvoltage event</td>
</tr>
<tr>
<td>8</td>
<td>Tamper detected</td>
</tr>
<tr>
<td>9</td>
<td>Whenever there is a change of meter settings locally</td>
</tr>
</tbody>
</table>
**Undervoltage and overvoltage recording**

(b) A meter must support the recording of undervoltage and overvoltage events. The thresholds shall be remotely and locally settable for undervoltage in the range of at least -5% to -20% in 1% steps and for overvoltage in the range of at least +5% to +20% in 1% steps.

**Tamper detection**

(c) A meter must support the detection and recording of an attempt to tamper with the meter as an event.

**S7A.5.3.8 Tamper detection**

A meter must support the detection and recording as an event attempts to tamper with the meter.

**S7A.5.3.9 Communications and data security**

All device elements must contain the necessary security to prevent unauthorised access or modification of data.

**S7A.5.3.10 Remote firmware upgrades**

Meters must have the capability for their firmware to be remotely upgraded. It must be possible to remotely change firmware without impacting the metrology functions of the meter.

**S7A.5.3.11 Remote arming**

Meters must have the capability to be remotely armed.

**Schedule 7A.6 Inspection and testing requirements**

**S7A.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 S7A.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:

   (i) clause 7A.7.2 and this schedule; or

   (ii) an asset management strategy that defines an alternative testing practice (other than time based) determined by the Metering Coordinator and approved by NTESMO;

(2) in accordance with a test plan that has been registered with NTESMO;

(3) to the same requirements as for new equipment where equipment is to be recycled for use in another site; and
(4) so as to include all data storage and processing components specified in schedule 7A.7.

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

(e) The maximum allowable level of testing uncertainty (±) for all metering equipment must be in accordance with Table S7A.6.1.1.

**Table S7A.6.1.1 Maximum allowable level of testing uncertainty (±)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Metering Equipment Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 0.2</td>
</tr>
<tr>
<td>In Laboratory</td>
<td>CTs ratio</td>
</tr>
<tr>
<td>Phase</td>
<td>0.07 crad</td>
</tr>
<tr>
<td>VTs ratio</td>
<td>0.05%</td>
</tr>
<tr>
<td>Phase</td>
<td>0.05 crad</td>
</tr>
<tr>
<td>Meters Wh</td>
<td>0.05/cosφ%</td>
</tr>
<tr>
<td>Meters varh</td>
<td>n/a</td>
</tr>
<tr>
<td>In Field</td>
<td>CTs ratio</td>
</tr>
<tr>
<td>Phase</td>
<td>0.15 crad</td>
</tr>
<tr>
<td>CTs ratio</td>
<td>0.1%</td>
</tr>
<tr>
<td>Phase</td>
<td>0.15 crad</td>
</tr>
<tr>
<td>VTs ratio</td>
<td>0.1%</td>
</tr>
<tr>
<td>Phase</td>
<td>0.1 crad</td>
</tr>
<tr>
<td>Meters Wh</td>
<td>0.1/cosφ%</td>
</tr>
<tr>
<td>Meters varh</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Where \( \cos \phi \) is the power factor at the test point under evaluation.

**Table S7A.6.1.2 Maximum Period Between Tests**

Unless the Metering Coordinator has developed an approved asset management strategy that defines practices that meet the intent of this schedule, the maximum period between tests must be in accordance with Table S7A.6.1.2.

<table>
<thead>
<tr>
<th>Description</th>
<th>Metering Installation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type 1</td>
</tr>
<tr>
<td>CT</td>
<td>10 years</td>
</tr>
</tbody>
</table>
### Table S7A.6.1.3 Period between inspections

Unless the Metering Coordinator has developed an approved asset management strategy that meets the intent of this schedule and is approved by NTESMO, the maximum period between inspections must be in accordance with Table S7A.6.1.3.

<table>
<thead>
<tr>
<th>Description</th>
<th>Type 1</th>
<th>Type 2</th>
<th>Type 3</th>
<th>Type 4, 4A, 5 &amp; 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metering installation equipment inspection</td>
<td>2.5 years</td>
<td>12 months (2.5 years if check metering installed)</td>
<td>&gt; 10 GWh: 2 years 2≤ GWh ≤ 10: 3 years &lt;2 GWh: when meter is tested.</td>
<td>When meter is tested.</td>
</tr>
</tbody>
</table>

### S7A.6.2 Technical guidelines

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

(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 (but is not mandatory).
(e) For \( \sin \phi \) and \( \cos \phi \), refer to the ISO "Guide to the Expression of Uncertainty in Measurement", where \( \cos \phi \) is the \textit{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 \textit{meter} parameters and physical connections; and
(5) \textit{current transformer} ratios by comparison.

\textbf{Schedule 7A.7 \ Metrology procedure}

\textbf{Part A}

\textbf{S7A.7.1 \ Introduction}

\textbf{S7A.7.1.1 \ General}

(a) This schedule applies to \textit{NTESMO, Registered Participants, Metering Coordinators, Metering Providers, Metering Data Providers} and the \textit{Utilities Commission} in relation to \textit{connection points} in this jurisdiction.

(b) This schedule provides information on the application of \textit{metering installations} to \textit{connection points} and sets out provisions for \textit{metering installations} and \textit{metering data services}.

(c) For service provision at \textit{connection points} where:

(1) the \textit{Metering Provider} and the \textit{Metering Data Provider} are part of the same company; and

(2) \textit{metering installation}, provision or maintenance work is performed using internal processes and procedures,

those internal processes and procedures will be taken to be compliant with this schedule if the \textit{metering} work satisfies the performance and quality outcomes of this schedule.

\textbf{S7A.7.1.2 Definitions}

In this schedule:

\textbf{accumulation meter} means a \textit{meter} where the \textit{energy data} recorded in the \textit{meter} represents a period in excess of a \textit{recording interval}.

\textbf{estimated reading} means:

(a) an estimate of a \textit{meter} reading where an \textit{actual meter reading} has not occurred; or

(b) a substitute of a \textit{meter} reading used for the purposes of transferring a \textit{retail customer} to a new \textit{Retailer} where an \textit{actual meter reading} has not occurred.

\textbf{final reading} means the last \textit{actual meter reading} for a \textit{retail customer} when they vacate an address or change \textit{retailer} or the last \textit{actual meter reading} reading taken before
all or any part of a metering installation is removed or modified and where the modification affects the energy data in the metering installation.

ILAC means International Laboratory Accreditation Cooperation.

inventory table means a table of devices for unmetered loads associated with each NMI as described in clauses S7A.7.14.2(c) and S7A.7.14.3(c).

load table means a table of unmetered device loads as described in clause S7A.7.14.1.

on/off table means a table recording the switching status (On = 1, Off = 0) for each recording interval for the unmetered loads associated with a NMI as described in Part B of this schedule.

physical inventory means a physical count of devices.

public holiday means a day that is a public holiday, as defined in section 17 of the Interpretation Act 1978(NT), that is observed in the City of Darwin, other than a public holiday that is part of a day.

routine testing, for the purposes of this schedule, includes the ongoing and regular maintenance testing, compliance testing and in-service testing of metering installation components initiated by the Metering Coordinator or Metering Provider to fulfil their obligations in accordance with schedule 7A.6.

Sample Test Plan means a statement of the sample size or sizes to be taken, the frequency of sample testing and the required accuracy.

scheduled reading date means the date of the next scheduled meter reading.

unmetered means a load or a connection point at which a meter is not necessary under schedule 7A.6.

S7A.7.1.3 Relevant retailer

In this schedule, a reference to the relevant retailer is a reference to Power Retail Corporation (trading as Jacana Energy) ABN 65 889 840 667.

Part B

S7A.7.2 Purpose and scope

S7A.7.2.1 Purpose

The purpose of this Part is to set out:

(a) the obligations of the Metering Coordinator, in relation to metering installations that are referred to in the Rules;

(b) the obligations of Metering Providers in relation to the provision, installation, routine testing and maintenance of a metering installation; and

(c) the obligations of Metering Data Providers in relation to the provision of metering data services.
S7A.7.2.2 Scope

This schedule provides information on the application of metering installations to connection points. In particular, this schedule sets out provisions for metering installations and metering data services relating to:

(a) **Metering Providers**, which include:
   (1) the type of metering installation permitted for the measurement of active energy;
   (2) the provision, installation, testing, inspection and maintenance of metering installations;
   (3) the components of each type of metering installation; and
   (4) storage of, and access rights to, energy data in the metering installation; and

(b) **Metering Data Providers**, which include:
   (1) the collection or calculation, processing and delivery of metering data; and
   (2) storage of metering data in the metering data services database and rights of access to metering data.

S7A.7.3 Metering provision

S7A.7.3.1 Responsibility for metering provision

(a) **Metering Coordinators** must use **Metering Providers** to provide, install, test and maintain the relevant components, characteristics and service requirements of the metering installation as specified in the Rules.

(b) **Metering Coordinators** are responsible for the design of a metering installation and warrant that the design complies with the components, characteristics and service requirements specified in the Rules.

(c) **Metering Coordinators** must ensure the components have been selected, installed, tested and commissioned by the **Metering Providers** so that the metering installation satisfies the relevant accuracy and performance requirements in the Rules.

S7A.7.3.2 Metering installation components

(a) **Meters** used in type 1, 2, 3, 4, 4A, 5 and 6 metering installations must comply with any applicable specifications or guidelines (including transitional arrangements) specified by the National Measurement Institute, under the National Measurement Act, and must also meet the relevant requirements of Australian Standards and International Standards:

   (1) for type 1, 2, 3, 4, 4A, and 5 (including type 3 and 4 whole current) metering installation measurement elements: AS 62052.11, AS 62053.21 and AS 62053.22; and
   (2) for type 6 metering installation measurement elements: AS 1284.1, AS 62053.21 and AS 62052.11.
(b) Current transformers for type 1, 2, 3, 4, 4A, 5 and 6 metering installations must meet the relevant requirements of AS 60044.1 and must also comply with any applicable specifications or guidelines (including transitional arrangements) specified by the National Measurement Institute under the National Measurement Act.

(c) Voltage transformers for type 1, 2, 3, 4, 4A, 5 and 6 metering installations must meet the relevant requirements of AS 60044.2, AS 60044.3, AS 60044.5 and AS 1243 and must also comply with any applicable specifications or guidelines (including transitional arrangements) specified by the National Measurement Institute under the National Measurement Act.

(d) New current transformers and voltage transformers must comply with current Australian Standards.

(e) In-service current transformers and voltage transformers must comply with the Australian Standard that applied at the time of installation.

(f) Unless otherwise permitted by the Rules, the Metering Coordinator must ensure that new meters and related equipment used at a connection point 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 issued by a NATA accredited laboratory or a body recognised by NATA under the ILAC mutual recognition scheme. Relevant approval certificates must be provided to the Utilities Commission on request.

(g) A visible display must be provided to display, at a minimum, the cumulative total energy for each register measured by that metering installation.

(h) Any programmable settings available within the metering installation, or any peripheral device, which may affect the resolution of displayed or stored data, must meet the relevant requirements of AS 62052.11, AS 62053.21 and AS 62053.22 and must comply with any applicable specifications or guidelines (including transitional arrangements) specified by the National Measurement Institute under the National Measurement Act.

S7A.7.3.3 Use of optical ports and pulse outputs

(a) Where requested by a financially responsible participant, the Metering Coordinator must provide pulse output facilities representing the quantity of electricity measured in accordance with the relevant Australian Standard for that meter within a reasonable time of receiving the request.

(b) For type 1, 2, 3, 4, 4A and 5 metering installations with a pulse output, the measurement element pulse output must provide a number of energy pulses in each integrating period commensurate with the accuracy class of the metering installation when operating at the top of the range of measurement of the metering installation but may be set at a lower rate where the anticipated operating range is significantly lower than the top of the range of measurement of the metering installation.

(c) A type 4A or 5 metering installation must have an optical port that meets the AS 1284.10.2 or AS 62056.21 or a computer serial port to facilitate downloading of 90 days of interval energy data for each meter associated with the metering installation in 35 seconds or less.
S7A.7.3.4 Load control equipment

Where the metering installation includes equipment for load control or the measurement of reactive energy, the installation and operation of that equipment will be governed by an instrument other than the Rules, for example, a 'use of system' agreement between the Local Network Service Provider and the financially responsible participant.

S7A.7.3.5 Data storage requirements for meters

Note

No specific requirements are included under this heading for this jurisdiction at this stage. The clause may be used as part of the phased implementation of the Rules in this jurisdiction.

S7A.7.3.6 Metering installation clock

(a) A type 4A, 5 or 6 metering installation clock is to be reset to within ± 20 seconds of Australian Central Standard Time on each occasion that the metering installation is accessed in the circumstances referred to in paragraphs (b) and (c), and the maximum drift in the type 4A or 5 metering installation clock permitted between successive meter readings is ± 300 seconds.

(b) A Metering Provider must reset a type 4A, 5 or 6 metering installation clock when inspecting, maintaining or commissioning the metering installation.

(c) A Metering Data Provider must reset a type 4A, or 5 metering installation clock when interval metering data is collected from the metering installation.

(d) For type 6 metering installations with different time of day rates, the metering installation must meet AS 62054.11, AS 62054.21 and AS 62052.21, or have the switching between the different rates controlled by a frequency injection relay or time clock operated by the Local Network Service Provider.

S7A.7.3.7 Interval meters

Where a metering installation records interval energy data the interval periods must be based on recording intervals or parts of a recording interval in accordance with the following requirements:

(a) the end of each interval for a 15-minute interval period must be on the hour, on the half-hour and on each quarter of an hour (ACST);

(b) the end of each interval for a 30-minute interval period must be on the hour and on the half-hour (ACST);

(c) for other sub-multiple intervals –where agreed with NTESMO(in respect of a metering installation that is used for the purposes of settlements), the Local Network Service Provider and the relevant financially responsible participant, provided that the ends of the intervals correspond each and every exact hour (ACST) and half-hour (ACST).
S7A.7.3.8 Alarm settings

(a) Where an interval meter supports alarm functionality, the Metering Provider is required to enable the following alarms:

(1) power failure/meter loss of supply for instrument transformer connected metering installations only;
(2) voltage transformer or phase failure;
(3) pulse overflow;
(4) cyclic redundancy check error; and
(5) time tolerance.

(b) Where there are alarm sensitivity settings, these must be set at appropriate levels to ensure meaningful alarm outputs (for example, for contestable supplies a voltage drop of -15% is nominally appropriate).

S7A.7.3.9 Summation metering

(a) If summation metering is achieved by paralleling current transformer secondary circuits, the overall metering system must meet the minimum standards for a new metering installation under all load combinations of the individual current transformer secondaries.

(b) If summation metering is achieved by the arithmetic sum of data registers or the accumulation of pulses, each individual metering point must meet the minimum standards for a new metering installation and the Metering Coordinator must on request demonstrate that the summation techniques reliably and accurately transfer data.

(c) Current transformer secondaries can only be paralleled using appropriate arrangements of links; this must not be done at the meter terminals.

(d) For type 2 metering installations only – direct summation, in which secondary wiring from a multiple number of feeders are connected directly into the terminals of a meter, or summation current transformers, are permitted provided that the overall errors of the installation are considered.

S7A.7.3.10

Note

No requirements are included in this clause for this jurisdiction at this stage. The clause may be used as part of the phased implementation of the Rules in this jurisdiction.

S7A.7.3.11 Routine testing and inspection of metering installations

(a) Unless a Metering Coordinator has an Asset Management Strategy approved by NTESMO, metering installations must be tested and inspected in accordance with rule 7A.7 and schedule 7A.6. Paragraphs (b) to (f) provide guidelines that:

(1) the Metering Coordinator will need to take into consideration when seeking approval of an Asset Management Strategy; and
(2) NTESMO will need to take into consideration in approving a proposed Asset Management Strategy.
(b) An acceptable alternative testing practice or test plan for in-service meter performance must demonstrate compliance with Australian Standard "AS 1284.13: Electricity Metering in-service compliance testing".

(c) Unless the Metering Coordinator has developed an alternative accuracy assessment method for type 5 and 6 metering installations that meets the intent of Tables S7A.4.2.5 and S7A.4.2.6 and is approved by NTESMO, the overall metering installation error is calculated by the vector sum of the errors of each metering installation component, being a + b + c where:

\[ a = \text{error of VT and wiring} \]
\[ b = \text{error of CT and wiring} \]
\[ c = \text{error of meter}. \]

(d) Where the Metering Coordinator is not testing and inspecting metering installations in accordance with rule 7A.7 and schedule 7A.6 (that is, not time-based), the Metering Coordinator must include in its Asset Management Strategy an alternative inspection practice that meets the requirements of schedule 7A.6.

(e) The Metering Coordinator must provide a copy of the Asset Management Strategy to each relevant Metering Provider.

(f) For those meters for which new or amended pattern approval has been received from the National Measurement Institute or, in the absence of pattern approval, new or amended type testing has been undertaken by a NATA accredited laboratory or a body recognised by NATA under the ILAC mutual recognition scheme, the Metering Coordinator must ensure that the Sample Test Plan stipulates that this population of meter is tested at least once in the first three years of being placed in service.

S7A.7.3.12 Requests for testing type 1 – 6 metering installations

(a) If requested by a Registered Participant with a financial interest in the metering installation or the energy measured by the metering installation, the Metering Coordinator must make arrangements for the testing of the metering installation in accordance with clause 7A.7.2 of the Rules.

(b) If requested by a Registered Participant with a financial interest in the metering installation, the Utilities Commission must make arrangements in accordance with clause 7A.7.4 of the Rules to determine the consistency of metering data held in the metering data services database and the energy data held in the type 1, 2, 3, 4, 4A, 5 and 6 metering installation.

(c) Where the Registered Participant requests a metering installation test in accordance with paragraphs (a) and (b):

(1) the Metering Coordinator or the Utilities Commission (as applicable) must use reasonable endeavours to conduct the test within 15 business days of the request;

(2) if the requirement under subparagraph (1) would prevent the Registered Participant's customer witnessing the test, then the Metering Coordinator or the Utilities Commission may agree to a mutually convenient time to conduct the test; and
S7A.7.4 Installation of meters and de-commissioning

S7A.7.4.1 General installation requirements

The Metering Coordinator must use reasonable endeavours to ensure that, at the time of installation, a metering installation is:

(a) protected against damage;

(b) installed in such a way that it allows safe and unimpeded access to the retail customer or any person whose obligation it is to test, adjust, maintain, repair, or replace the metering installation, or to collect metering data from the metering installation; and

(c) available to the retail customer or any person whose obligation it is to test, adjust, maintain, repair, or replace the metering installation, or to collect metering data from the metering installation via safe, convenient and unhindered access when it is not located at the site.

S7A.7.4.2 Type 4A, 5 and 6 metering installations

The Metering Coordinator must ensure that when each type 4A, 5 or 6 metering installation is installed at a connection point, it is checked such that it has the optical port, communications port and visual display located so that the optical port, communications port, or visual display can be readily accessed for meter reading.

S7A.7.4.3 Preliminary de-commissioning and removal of metering equipment requirements

(a) Before de-commissioning all or any part of an existing metering installation the Metering Provider undertaking the work must ensure that:

(1) arrangements are put in place to ensure a final reading is taken at the time of de-commissioning of all metering data maintained in the existing meter; and

(2) the ownership of the existing meter is ascertained and arrangements made for the meter to be returned to its owner within 10 business days unless otherwise agreed with the asset owner.

(b) Where the metering data from the final reading is not transferred to the relevant Metering Data Provider at the time of de-commissioning, the owner must ensure the metering data or final reading (as applicable), is provided to that Metering Data Provider within 2 business days of receipt of the meter.

S7A.7.4.4 Note

No requirements are included in this clause for this jurisdiction at this stage. The clause may be used as part of the phased implementation of the Rules in this jurisdiction.
S7A.7.5 Note
No requirements are included in this clause for this jurisdiction at this stage. The clause may be used as part of the phased implementation of the Rules in this jurisdiction.

S7A.7.6 Responsibility for metering data services

S7A.7.6.1 Metering data storage

Note
No requirements are included in this clause for this jurisdiction at this stage. The clause may be used as part of the phased implementation of the Rules in this jurisdiction.

S7A.7.6.2 Verification of metering data for type 4, 4A, 5, 6 and 7 installations

To facilitate the verification of metering data for type 4, 4A, 5, 6 and 7 metering installations:

(a) each Metering Coordinator must ensure that a Sample Test Plan is established and maintained in accordance with Australian Standards AS 1199: Sampling procedures for inspection by attributes – Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection or AS 2490: Sampling Procedures and Charts for Inspection by Variables for Percent Nonconforming to validate that all metering data stored in the metering data services database is consistent with the energy data stored in the metering installation or the physical inventory (as applicable);

(b) verification tests must be conducted in accordance with the Sample Test Plan, which must not be less than once every 12 months;

(c) the calculated metering data stored in a metering data services database for a NMI is consistent with the physical inventory if the error associated with calculating the energy value for the sample, that is:

\[
\frac{\sum_{i=1}^{n} (\text{Agreed load per device type as per load table}) \times (\text{Actual number of device type in the sample geographic area})}{\sum_{i=1}^{n} (\text{Number of device type in the sample geographic area as per inventory table})} - 1
\]

where \(i = \text{device type}\)

is within ± 2.0%; and

(d) if there is an inconsistency between the inventory table held in a metering data services database for a type 7 metering installation and the physical inventory, the physical inventory is to be taken as prima facie evidence of the actual number of unmetered devices.

Note
Provisions relating to type 7 metering installations will only apply in this jurisdiction in the event of a type 7 metering installation being available in this jurisdiction and after a 12 month transitional period allowing all participants to achieve compliance.
S7A.7.6.3 Metering installation type 7 – sample testing

(a) For the purposes of sample testing type 7 metering installations, the Metering Coordinator must ensure that the sample size is determined using Table S7A.7.5.3.1. The sample is to be selected from unmetered devices in the inventory table for a Metering Coordinator.

(b) The Metering Coordinator must ensure that the sample size for the first two validation tests is based on a 'normal' sample size indicated in Table S7A.7.5.3.1.

<table>
<thead>
<tr>
<th>Number of Unmetered Devices in Inventory Table</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reduced</td>
</tr>
<tr>
<td>2 to 8</td>
<td>2</td>
</tr>
<tr>
<td>9 to 15</td>
<td>2</td>
</tr>
<tr>
<td>16 to 25</td>
<td>3</td>
</tr>
<tr>
<td>26 to 50</td>
<td>5</td>
</tr>
<tr>
<td>51 to 90</td>
<td>5</td>
</tr>
<tr>
<td>91 to 150</td>
<td>8</td>
</tr>
<tr>
<td>151 to 280</td>
<td>13</td>
</tr>
<tr>
<td>281 to 500</td>
<td>20</td>
</tr>
<tr>
<td>501 to 1200</td>
<td>32</td>
</tr>
<tr>
<td>1201 to 3200</td>
<td>50</td>
</tr>
<tr>
<td>3201 to 10000</td>
<td>80</td>
</tr>
<tr>
<td>10001 to 35000</td>
<td>125</td>
</tr>
<tr>
<td>35001 to 150000</td>
<td>200</td>
</tr>
<tr>
<td>150001 to 500000</td>
<td>315</td>
</tr>
<tr>
<td>500001 to over</td>
<td>500</td>
</tr>
</tbody>
</table>

(c) The Metering Coordinator must ensure that the sample size for subsequent variation tests is based on the following:
(d) The Metering Coordinator must select sample unmetered devices for a validation test from random geographic areas depending on the sample size. The selection of the geographic area must be such that each unmetered device has an equal chance of being included in the sample.

(e) The Metering Coordinator must ensure that the validation test is conducted at least once every 6 months, commencing from the first validation test.

(f) Should the results of two consecutive validation tests, based on a reduced sample size, be within the accuracy requirements for that test, the Metering Coordinator must ensure that the next validation test is conducted at least once every 12 months.

S7A.7.6.4 Request for text of calculated metering data

If requested to test a type 7 metering installation by a Registered Participant under clause 7A.7.2, the Metering Coordinator must:

(a) arrange to test that the calculated metering data stored in the metering data services database reflects the physical inventory for the type 7 metering installation;

(b) use reasonable endeavours to conduct the test within 15 business days of the request; and

(c) prior to any test being undertaken, provide an estimate of costs associated with the test.
S7A.7.6.5 NTESMO's metering data substitution obligations

(a) Where metering data has been substituted, NTESMO must advise affected Registered Participants at the same time as that metering data is sent to financially responsible participants for settlements.

(b) If metering data has not been transferred to NTESMO to meet the settlements time frames or such metering data has been transferred but is unusable, NTESMO must, in accordance with clause 7A.9.2:

(1) take action to obtain the metering data; or

(2) request the Metering Coordinator take action to obtain the metering data.

Part C

S7A.7.7 Purpose and scope

S7A.7.7.1 Purpose

The purpose of this Part is to set out obligations concerning the validation, substitution and forward estimation of metering data to satisfy the Rules.

S7A.7.7.2 Scope

(a) This Part applies to Metering Data Providers, NTESMO and Metering Coordinators.

(b) This Part must be read in conjunction with Schedule 7A.8 Part B.

S7A.7.8 Principles for validation, substitution and estimation

S7A.7.8.1 General validation, substitution and estimation requirements

The principles to be applied to validation, substitution and estimation include the following:

(a) the Metering Coordinator must coordinate the resolution of issues arising from the non-performance of metering systems, including any liaison with associated Registered Participants, Metering Providers and Metering Data Providers, and the Metering Coordinator must respond promptly to requests for remedial action from the Metering Data Provider or NTESMO;

(b) the Metering Data Provider must identify metering data errors resulting from data collection and processing operations using validation processes in accordance with this Part.

S7A.7.8.2 Substitution requirements

(a) The Metering Data Provider must undertake substitutions on behalf of NTESMO or the Metering Coordinator, as appropriate, in a manner consistent with this Part.

(b) Substitutions may be required in the following circumstances:

(1) where the system or equipment supporting the remote or manual collection of metering data has failed or is faulty;
(2) where the metering installation for a connection point has failed or is removed from service;

(3) to enable timely provision of metering data to financially responsible participants or NTESMO for billing transactions or settlements purposes, as relevant;

(4) in situations where metering data has been irretrievably lost;

(5) where the metering data is found to be erroneous or incomplete;

(6) where metering data has not completed validation as part of the registration or transfer of a connection point;

(7) where metering data has failed or has not completed the validation process;

(8) where metering data cannot be obtained in the performance timeframes required for the data period in question:
   (i) metering data for metering installations with remote acquisition must be substituted if metering data cannot be obtained to meet either settlements or billing transactions timeframes, as relevant, or the required performance in Schedule 7A.8 Part C; and
   (ii) metering data for manually read metering installations must be substituted if metering data cannot be obtained on or within the expected timeframe of the next scheduled reading date for a connection point, and any historical or previous estimated metering data must be replaced with substituted metering data;

(9) when an inspection or test on the metering installation establishes that a measurement error exists due to a metering installation fault;

(10) when the affected financially responsible participant, the relevant retailer and Local Network Service Provider have all agreed and subsequently informed the Metering Data Provider that a previous substitution was inaccurate and that a re-substitution of metering data is required;

(11) where the metering data calculation has failed the validation tests for a metering installation with calculated metering data;

(12) in response to customer transfers authorised in this jurisdiction;

(13) in situations involving meter churn.

S7A.7.8.3 Estimation requirement

(a) The Metering Data Provider must undertake estimations on behalf of the Metering Coordinator in a manner consistent with this Part.

(b) Estimations may be required in the following circumstances:

(1) routinely for a period equal to or just greater than the period to the next scheduled reading date or another forward period;

(2) in response to customer transfers authorised in this jurisdiction;

(3) where the current published scheduled reading date has changed due to a revised scheduled reading route and the existing estimated
metering data does not extend to or beyond the revised next scheduled reading date, and in this case the Metering Data Provider must adjust the estimated metering data for the revised next scheduled reading date.

S7A.7.8.4 Metering data quality flags

(a) The Metering Data Provider must assign the relevant metering data quality flags to metering data as follows:

<table>
<thead>
<tr>
<th>Quality Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Actual metering data.</td>
</tr>
<tr>
<td>S</td>
<td>For any substituted metering data that is considered temporary and may be replaced by actual metering data. Substitutions apply to historical date/time periods at the time of substitution.</td>
</tr>
<tr>
<td>E</td>
<td>For any estimated metering data that is considered temporary and may be replaced by actual metering data or substituted metering data. Estimations apply to a period that has an end date/time in the future.</td>
</tr>
<tr>
<td>F</td>
<td>For substitutions that are of a permanent or final nature and, subject to paragraph S7A.7.8.5(b) and (e), the metering data would not be replaced by actual metering data at any time.</td>
</tr>
<tr>
<td>N</td>
<td>This quality flag is only utilised within the interval metering data file for instances where no metering data exists in the metering data services database for the periods concerned.</td>
</tr>
</tbody>
</table>

(b) Unless specified otherwise in this Part, Metering Data Providers must apply the following quality flag rules in the metering data services database:

1. 'A' metering data can only be replaced with 'A', 'S' or 'F' metering data;
2. 'S' metering data can only be replaced with 'A', 'S' or 'F' metering data;
3. 'E' metering data can only be replaced with 'A', 'E', 'S' or 'F' metering data;
4. 'F' metering data can only be replaced with 'F' metering data as per paragraph S7A.7.8.5(f) or 'A' metering data as per paragraph S7A.7.8.5(b) or S7A.7.8.5(h).

S7A.7.8.5 Final substitution

The Metering Data Provider must undertake final substitutions in the following circumstances:

(a) where a notice has been received from either the Metering Coordinator or the Metering Provider detailing a failure of the metering installation that affects the quality of the energy data;
(b) if actual metering data is unexpectedly recovered from the metering installation and a final substitution has been undertaken in accordance with paragraph (1), and in this case the Metering Data Provider must replace the final substituted metering data with the actual metering data and maintain a record of the reason;

c) where the Metering Data Provider must undertake final substitutions following a meter churn;

d) where the Metering Data Provider has received a notice that the affected financially responsible participant, the relevant retailer and Local Network Service Provider have agreed that the metering data is erroneous and that a final substitution is required;

e) where NTESMO requests the provision of substitutions and final readings in response to customer transfers authorised in this jurisdiction where required for the purposes of settlements;

(f) where the Metering Data Provider may undertake to replace existing final substituted metering data with new final substituted metering data in accordance with this Part;

(g) where the Metering Data Provider has found actual metering data to be erroneous;

(h) where the Metering Data Provider is replacing type 6 final substituted metering data with accumulated metering data that spans consecutive meter readings on agreement with the financially responsible participant, the relevant retailer and the Local Network Service Provider.

S7A.7.9 Substitution for acquisition of metering data from remotely read metering installations

S7A.7.9.1 Application of S7A.7.9

(a) For metering installations with remote acquisition installed in accordance with paragraph 7A.6.8(a), the Metering Data Provider may perform substitutions in accordance with clause S7A.7.10.

(b) For all other metering installations with remote acquisition, the Metering Data Provider must perform substitutions in accordance with clause S7A.7.9.

S7A.7.9.2 Substitution rules

The Metering Data Provider must apply the following rules when performing a substitution:

(a) the Metering Data Provider must obtain clear and concise identification as to the cause of any missing or erroneous metering data for which substitutions are required;

(b) the Metering Data Provider must undertake to do a type 11 substitution and use metering data obtained from any check metering installation associated with the connection point as the first choice considered for the source of metering data for any substitutions undertaken;
(c) SCADA data, where available, may be used by the Metering Data Provider as check metering data for substitutions;

(d) the Metering Data Provider may only undertake substitution type 13 where substitution types 11 and 12 are not applicable or cannot be carried out;

(e) for connection points where the financially responsible participant is a generator:
   (1) the Metering Data Provider may directly undertake type 11, type 12 or type 13 substitutions if metering data has failed validation;
   (2) the Metering Data Provider may undertake type 16 or 18 substitutions following consultation and agreement with the affected generator that the substituted metering data is an accurate reflection of the interval metering data concerned;
   (3) if metering data cannot be collected from a metering installation or substituted within the required timeframes, the Metering Data Provider must undertake type 19 substitutions as an interim until metering data can be collected from the metering installation or substituted;

(f) the Metering Data Provider may only undertake substitution types 14, 15, 16, 17, 18, or 19 where substitution types 11, 12 and 13 are not applicable or cannot be carried out;

(g) the Metering Data Provider may perform all substitution types except type 16 or 18 without the agreement of the affected financially responsible participant, Local Network Service Provider or relevant retailer and the Metering Data Provider may change the quality flag to an existing type 16 or 18 substitution without seeking further agreement from those parties;

(h) the Metering Data Provider must notify the Local Network Service Provider, relevant retailer and the financially responsible participant for the connection point of any substitution within two business days of the substitution being carried out, and this notification is to be achieved via the participant metering data file as detailed in the MDFF Specification;

(i) where there is a metering installation malfunction that cannot be repaired within the periods specified in clause 7A.6.9, the Metering Data Provider must:
   (1) where the metering installation malfunction is due to a failure of the meter to correctly record interval energy data and the Metering Coordinator has been granted an exemption to repair the metering installation, substitute the missing metering data in accordance with this Part;
   (2) for type 1-3 metering installations and other instrument transformer connected metering installations, and where a metering installation malfunction is due to a failure of the remote acquisition system, arrange for an alternative method for the collection of metering data from the metering installation in a timeframe that ensures the Metering Data Provider complies with metering data delivery requirements; or
(3) for non-instrument transformer connected metering installations, and where a metering installation malfunction is due to a failure of the remote acquisition system, substitute the missing metering data in accordance with this Part;

(j) the Metering Data Provider must ensure that all substituted metering data is replaced with actual metering data when it becomes available.

S7A.7.9.3 Substitution types

Type 11 – Check data

(a) To perform a type 11 substitution, the Metering Data Provider must use interval metering data obtained from the check metering installation for that metering point where:

(1) the metering installation and check metering installation are installed at the same connection point;

(2) the metering installation and check metering installation are installed on different ends of a transmission line where the difference due to transmission line losses can be accurately determined; or

(3) the metering installation and the check metering installation are installed across a parallel set of feeders having similar line impedances between a common set of busbars.

Type 12 – Calculated

(b) To perform a type 12 substitution, the Metering Data Provider must calculate the interval metering data to be substituted where they relate to a single unknown feed to a node based on the other known energy flows to or from that node.

Type 13 – SCADA

(c) To perform a type 13 substitution:

(1) the Metering Data Provider must use SCADA data provided by NTESMO in the agreed format for substitution purposes, which originates from a similar measurement point as the meter;

(2) where SCADA data is inferior in accuracy or resolution and in a dissimilar format to the metering data, (for example, 30 Min. demand values). the Metering Data Provider may have to adjust the data in both magnitude and form so that the substitution is valid; and

(3) where SCADA data is to be used for Substitution, both the provided 'E' channel and 'B' channel SCADA data streams must be used.

Type 14 – Like day

(d) To perform a type 14 substitution, the Metering Data Provider must substitute missing or erroneous metering data using the nearest equivalent day or like day method, as detailed in Table 1.
Table 1

<table>
<thead>
<tr>
<th>Substitution day</th>
<th>Nearest equivalent day or like day (in order of availability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Monday ##</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Tuesday## Wednesday## Thursday## Wednesday# Thursday#</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Wednesday## Tuesday# Thursday## Thursday## Tuesday##</td>
</tr>
<tr>
<td>Thursday</td>
<td>Thursday## Wednesday## Tuesday## Wednesday## Tuesday##</td>
</tr>
<tr>
<td>Friday</td>
<td>Friday##</td>
</tr>
<tr>
<td>Saturday</td>
<td>Saturday##</td>
</tr>
<tr>
<td>Sunday</td>
<td>Sunday##</td>
</tr>
</tbody>
</table>

Substitutions for like day to be as detailed above, unless:

(a) No metering data is available on the first listed day, the next listed preferred day is to be used. If there is no other suitable listed day, or no metering data is available on any of the listed days type 15 substitution must be used.

(b) The substitution day was a public holiday, in which case the most recent Sunday is to be used.

(c) The substitution day was not a public holiday and the listed day is a public holiday, then the next listed preferred day that is not a public holiday is to be used.

  # Occurring in the same week as the substitution day.

  ## Occurring in the week preceding that in which the substitution day occurs.

Type 15 – Average like day

(e) To perform a type 15 substitution, the Metering Data Provider may substitute missing or erroneous metering data using the average like day method, as detailed in Table 2.

Table 2

<table>
<thead>
<tr>
<th>TYPE 15</th>
</tr>
</thead>
</table>
The interval metering data to be substituted will be calculated using an average of the metering data from each corresponding interval from the preceding 4 weeks, or any part of those. This averaging technique may be applied in either of the following ways:

(a) where the averaged interval metering data is used to provide the value for the metering data requiring substitution;

(b) where the averaged interval metering data is used to provide the profile and is scaled to a pre-determined consumption value for the metering data to be substituted.

Type 15 substitutions must not be used for public holidays.

Type 16 – Agreed method

(f) Where the Metering Data Provider is required to undertake substitution for any period greater than seven days for type 1 – 3 metering installations or greater than 15 days for other metering installation types, the Metering Data Provider must consult and use reasonable endeavours to reach an agreement with the financially responsible participants, relevant retailer and the Local Network Service Provider for the connection point. This may include changes to existing substitutions for any period where those affected parties have directed that as a result of site or end user information, the original substitutions are in error and a correction is required.

Type 17 – Linear interpolation

(g) To perform a type 17 substitution, the Metering Data Provider may substitute metering data for consecutive intervals up to, but not exceeding two hours, by using simple linear interpolation.

Type 18 – Alternative

(h) To perform a type 18 substitution, the Metering Data Provider may use an alternative method of substitution subject to agreement with the financially responsible participants, relevant retailer and the Local Network Service Provider for the connection point. The specifics of this substitution type may involve a globally applied method or a method where an adjusted profile is used to take into account local conditions that affect consumption (for example, local holiday or end user shutdown), or where alternative metering data may be available for quality checks, such as using metering register data.

Type 19 – Zero

(i) The Metering Data Provider must undertake substitutions of ‘zero’ where:

(1) the Local Network Service Provider or the Metering Provider has informed the Metering Data Provider of a de-energised connection point or an inactive meter and the consumption is reasonably believed to be zero; or
substitutions are applicable for connection points where the financially responsible participant is a Generator in accordance with clause S7A.7.9.2.

S7A.7.10 Substitution and estimation for manually read interval metering installations

S7A.7.10.1 Application of S7A.7.10

(a) The substitution and estimation requirements in this clause S7A.7.10 are only to be used for metering installations where:

(1) interval metering data is manually collected as a scheduled meter reading; or

(2) the metering installations have been installed with remote acquisition in accordance with paragraph 7A.6.8(a).

(b) Where remote acquisition of metering data has failed at the metering installation and manual collection of interval metering data is required, the substitution requirements specified in clause S7A.7.9 apply.

S7A.7.10.2 Substitution and estimation rules

(a) The Metering Data Provider must ensure that all substituted metering data and estimated metering data are replaced with actual metering data when it becomes available.

(b) The Metering Data Provider must obtain clear and concise identification as to the cause of any missing or erroneous metering data for which substitutions are required.

(c) Where there is a metering installation malfunction that cannot be repaired within the periods specified in clause 7A.6.9, the Metering Data Provider must substitute the missing metering data in accordance with this Part.

(d) The Metering Data Provider must only apply the following substitution and estimation types:

(1) substitutions may be type 51, 52, 53, 54, 55, 56, 57 or 58;

(2) estimations may be type 51, 52, 56, 57 or 58.

(e) The Metering Data Provider must only use type 56 or 57 substitutions or estimations where the historical data does not support the application of a type 51 or 52 substitution or estimation.

(f) The Metering Data Provider must notify the Local Network Service Provider, the relevant retailer and the financially responsible participant for the connection point of any substitution or estimation within 2 business days of the substitution.

(g) Metering Data Providers must not perform type 53 or 55 substitutions or type 56 substitutions or estimations without the agreement of the Local Network Service Provider, the relevant retailer and the financially responsible participant for the connection point. Metering Data Providers may change the quality flag to an existing type 53 or 55 substitution or type
substitution or estimation without seeking further agreement from those parties.

S7A.7.10.3 Substitution and estimation types

**Type 51 – Previous years method (nearest equivalent day or like day method)**

(a) To perform a type 51 substitution, the Metering Data Provider must provide a substitute or estimate using the metering data from the nearest equivalent day or like day from the same, or similar, meter reading period in the previous year. The nearest equivalent day or like day is to be determined from Table 3.

**Type 52 – Previous meter reading method (nearest equivalent day or like day method)**

(b) To perform a type 52 substitution, the Metering Data Provider must provide a substitute or estimate using the metering data from the nearest equivalent day or like day from the previous meter reading period. The nearest equivalent day or like day is to be determined from Table 3.

<table>
<thead>
<tr>
<th>TABLE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TYPE 51 or 52</strong></td>
</tr>
<tr>
<td><strong>Substitution day</strong></td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
<tr>
<td>Saturday</td>
</tr>
<tr>
<td>Sunday</td>
</tr>
</tbody>
</table>

Substitutions or estimations for like day to be as detailed above, unless:

(a) no metering data is available on the first listed day, in which case the next listed preferred day is to be used. If there is no other suitable day, or no metering data is available on any of the listed days, type 52 must be used;

(b) the substitution or estimation day was a public holiday, in which case the most recent Sunday is to be used; or

(c) the substitution or estimation day was not a public holiday and the listed
day is a public holiday, in which case the next listed preferred day that is not a public holiday, Saturday or Sunday is to be used.

# For type 51 utilise metering data from the corresponding week in the previous year.

# For type 52 utilise metering data from the corresponding week of the previous meter reading period.

# For type 51 utilise metering data from the week preceding the corresponding week in the previous year.

# For type 52 utilise metering data occurring in the week preceding the corresponding week of the previous meter reading period.

(c) Alternatively, the Metering Data Provider must provide substituted metering data or estimated metering data using the average like day method, as detained in Table 4.

Table 4

<table>
<thead>
<tr>
<th>TYPE 52 (Alternative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The interval metering data for which substitution or estimation is to be carried out will be calculated using an average of the metering data from each corresponding interval from any part, or all, of the preceding 4 weeks. This averaging technique may be applied in either of the following ways:</td>
</tr>
<tr>
<td>• where the averaged interval metering data is used to provide the value for the metering data requiring substitution or estimation;</td>
</tr>
<tr>
<td>• where the averaged interval metering data is used to provide the profile and are scaled to a pre-determined consumption value for the metering data that are the subject of substitution or estimation.</td>
</tr>
</tbody>
</table>

Type 52 substitutes or estimates must not be used for public holidays.

Type 53 – Revision of substituted metering data

(d) To perform a type 53 substitution, the Metering Data Provider must re-substitute or change substituted metering data to collecting an actual meter reading, where the financially responsible participant, the relevant retailer and the Local Network Service Provider have agreed, on the basis of site or end user information, that the original substituted metering data is in error and a correction is required.

Type 54 – Linear interpolation

(e) To perform a type 54 substitution, the Metering Data Provider may substitute metering data for intervals up to, but not exceeding 2 hours, by using simple linear interpolation.
Type 55 – Agreed substitution method
(f) To perform a type 55 substitution, the Metering Data Provider may undertake to use another method of substitution (which may be a modification of an existing substitution type), where none of the existing substitution types apply, subject to using reasonable endeavours to form an agreement with the financially responsible participant, the relevant retailer and Local Network Service Provider for the connection point. The specifics of this substitution type may involve a globally applied method.

Type 56 – Prior to first reading – agreed method
(g) Prior to the first actual meter reading and where no historical data exists for the connection point, the Metering Data Provider may provide a substitution or estimation for the interval metering data using a method agreed between the financially responsible participant, the relevant retailer and Local Network Service Provider.

Type 57 – Prior to first reading – customer class method
(h) [Not used]

Type 58 – Zero
(i) The Metering Data Provider must undertake substitutions or estimations of 'zero' where either the Local Network Service Provider or the Metering Provider has informed the Metering Data Provider of a de-energised connection point or an inactive meter and where the consumption is known to be zero.

S7A.7.11 Substitution and estimation for metering installations with accumulated metering data

S7A.7.11.1 Substitution and estimation rules
(a) The Metering Data Provider must replace all estimated metering data with either actual metering data or substituted metering data when:

(1) actual metering data covering all or part of the estimation period is obtained;

(2) the scheduled meter reading could not be undertaken, by replacing the estimated metering data with substituted metering data with a quality flag of 'F'; or

(3) the scheduled meter reading could not be undertaken, by replacing the estimated metering data with substituted metering data with a quality flag of 'F' unless it was identified that the metering installation no longer has an accumulation meter installed, in which case a quality flag of 'S' may be used.

(b) Any final substituted metering data provided by the Metering Data Provider must be re-validated, updated or re-calculated by the Metering Data Provider when:

(1) the value of the metering data obtained at the next actual meter reading is found to be less than the previous final substitution; or
(2) the final substituted value is disputed and following consultation and agreement with the financially responsible participant, the relevant retailer and the Local Network Service Provider for the connection point, the new agreed value will be determined using type 64 substitution.

(c) The Metering Data Provider must obtain clear and concise identification as to the cause of any missing or erroneous metering data for which substitutions are required.

(d) The Metering Data Provider may apply the following substitution and estimation types:

(1) substitutions may be type 61, 62, 63, 64, 65, 66, 67 or 68;

(2) estimations may be type 61, 62, 63, 65 or 68.

When to use Type 62 substitution

(e) Where the scheduled meter reading cycle is less frequent than monthly, the Metering Data Provider may only use a type 62 substitution or estimation method when metering data from the same, or similar, meter reading period last year (that is, type 61) is not available.

When to use Type 63 substitution

(f) The Metering Data Provider may use type 63 substitutions or estimations only when the metering data from the same, or similar, meter reading period last year and metering data from the previous meter reading period is not available (that is, when type 61 and type 62 substitution or estimation methods cannot be used).

When to use Type 65 substitution

(g) The Metering Data Provider may use type 65 substitutions or estimations only when the metering data from the same, or similar, meter reading period last year or the metering data from the previous meter reading period is not available (that is, when type 61 and type 62 substitution or estimation methods cannot be used).

When to use Type 67 substitution

(h) The Metering Data Provider must only use a type 67 substitution when:

(1) directed by the Metering Coordinator;

(2) not expressly disallowed in this jurisdiction;

(3) the retail customer-provided meter reading meets the validation rules for that data stream; or

(4) the Metering Data Provider has no actual metering data.

When to use Type 64 or 66 substitution

(i) Metering Data Providers must not perform type 64 or 66 substitutions without seeking the agreement of the financially responsible participant, the relevant retailer and the Local Network Service Provider for the connection point. Metering Data Providers may, however, undertake to change the
quality flag to an existing type 64 or 66 substitution without seeking further agreement from those parties.

(j) The Metering Data Provider must notify the relevant parties for the connection point of any substitution or estimation within 2 business days of the substitution or estimation. Notification must comply with the obligations set out in S7A.8.9.11.

S7A.7.11.2 Substitution and estimation types

Type 61 – Previous year method (average daily consumption method)

(a) To perform a type 61 substitution, the Metering Data Provider must provide a substitution or estimation of the meter reading by calculating the energy consumption as per the following formula:

\[
\text{Energy Consumption} = \text{ADC}_{LY} \times \text{number of days required}
\]

where

\[
\text{ADC}_{LY} = \text{average daily consumption from the same or similar meter reading period last year.}
\]

Type 62 – Previous meter reading method (average daily consumption method)

(b) To perform a type 62 substitution, the Metering Data Provider must provide a substitution or estimation of the meter reading by calculating the energy consumption as per the following formula:

\[
\text{Energy Consumption} = \text{ADC}_{PP} \times \text{number of days required.}
\]

where

\[
\text{ADC}_{PP} = \text{average daily consumption from the previous meter reading period.}
\]

Type 63 – Customer class method

(c) To perform a type 63 substitution, the Metering Data Provider must provide a substitution or estimation by calculating the energy consumption as per the following formula:

\[
\text{Energy Consumption} = \text{ADC}_{CC} \times \text{number of days required}
\]

where

\[
\text{ADC}_{CC} = \text{average daily consumption for this customer class with the same type of usage.}
\]

Type 64 – Agreed method

(d) To perform a type 64 substitution, the Metering Data Provider may undertake to use another method of substitution (which may be a modification of an existing substitution type), where none of the existing substitution types are applicable, subject to using reasonable endeavours to form an agreement with the financially responsible participant, the relevant
retailer and Local Network Service Provider for the connection point. The specifics of this substitution type may involve a globally applied method.

**Type 66 – ADL method**

(e) [Not used]

**Type 66 – Revision of substituted metering data**

(f) To perform a type 66 substitution, the Metering Data Provider must re-substitute or change substituted metering data prior to collecting an actual meter reading where the financially responsible participant, the relevant retailer and the Local Network Service Provider for the connection point have agreed to revise the original substituted metering data, on the basis of site or end user specific information.

**Type 67 – Customer reading**

(g) Unless the Metering Data Provider is required to apply a type 68 substitution, the Metering Data Provider must substitute any previously substituted metering data or estimated metering data based directly on a meter reading provided by an end user.

**Type 68 – Zero**

(h) The Metering Data Provider must undertake substitutions or estimations of 'zero' where either the Local Network Service Provider or Metering Provider has informed the Metering Data Provider of a de-energised connection point or an inactive meter and where the consumption is known to be zero.

**S7A.7.12 Substitution and estimation for calculated metering data**

**S7A.7.12.1 Substitution rules**

(a) The Metering Data Provider must:

(1) obtain clear and concise identification as to the cause of any missing or erroneous calculated metering data for which substituted metering data are required;

(2) ensure that all substituted metering data and estimated metering data are based on calculated metering data and not on any previous substitutions or estimations (as applicable);

(3) base calculated metering data for type 7 metering installations on inventory table data as follows:

(i) where the inventory table has not been updated for the period concerned, calculated metering data must be based on the most recent available information and provided as an estimate; and

(ii) where the inventory table is correct for the period concerned, the calculated metering data must be flagged as 'A' metering data, however, when the inventory table is subsequently updated for the period concerned, the calculated metering data must be flagged as 'F' metering data;
(4) notify the Local Network Service Provider, the relevant retailer and
the financially responsible participant for the connection point of any
substituted calculated metering data within 2 business days of the
substitution, and this notification is achieved via the Participant
metering data file as detailed within Schedule 7A.8; and

(5) flag all calculated metering data substitutions as 'F'.

(b) The Metering Data Provider may apply the following substitution and
estimations types:

(1) substitutions may be type 71, 72, 73, or 74;
(2) estimations may be type 75.

S7A.7.12.2 Substitution and estimation types

Type 71 – Recalculation
(a) To perform a type 71 substitution, the Metering Data Provider must
substitute calculated metering data with the calculated metering data
obtained by a recalculation based on the current inventory tables, load tables
and on/off tables.

Type 72 – Revised tables
(b) Where the error in the calculated metering data is due to errors in the
inventory table, load table and on/off table, the Metering Data Provider
must substitute calculated metering data by a recalculation based on the
most recent inventory tables, load tables and on/off tables in which there
were no errors.

Type 73 – Revised algorithm
(c) Where the error in the calculated metering data is due to an error in its
calculation, the Metering Data Provider must substitute the most recent
calculated metering data for which there was no error.

Type 74 – Agreed method
(d) The Metering Data Provider may use another method of calculated
metering data substitution (which may be a modification of an existing
substitution type), where none of the existing substitution types is
applicable, subject to using reasonable endeavours to form an agreement
between the financially responsible participant, the relevant retailer and
Local Network Service Provider for the connection point. The specifics of
this substitution type may involve a globally applied method.

Type 75 – Existing table
(e) The Metering Data Provider must provide an estimate for the calculated
metering data based on the most recent inventory table until such time as an
updated inventory table is received for the period concerned.
S7A.7.13 Data validation requirements

S7A.7.13.1 Validation requirements for all metering installations

*Metering Data Providers* must manage systems and processes on the basis that:

(a) stored *metering data* held in the *meter* buffer might be subject to installation measurement error;

(b) data delivered by reading systems, (for example, remote reading systems, hand-held readers and conversion software) might not be recovered from the *meters* without corruption; and

(c) auditable validation procedures are of critical importance and can have a direct impact on disputes. It is essential that *Metering Data Providers* comply with these validation procedures and that all *metering data* is subject to validation prior to delivery to *NTESMO, Registered Participants* and financially responsible participants.

S7A.7.13.2 Validation of interval metering data alarms

(a) The *Metering Data Provider* must validate *interval metering data* against the following *meter* alarms when these are provided in the *meter*:

(1) power failure/*meter* loss of supply;
(2) *voltage transformer* or phase failure;
(3) pulse overflow;
(4) cyclic redundancy check error; and
(5) time tolerance.

(b) Where *interval metering installations* assign alarms to the data channel and the *interval metering data* concerned, the *Metering Data Provider* must process the alarm along with the *metering data* as part of the required validation.

(c) The *Metering Data Provider* must ensure that all *metering data* alarm reports are signed off and dated by the person actioning the data exception report review as part of the validation.

(d) The *Metering Data Provider* must validate all *interval metering data* with all *metering data* alarms prior to providing to *NTESMO, Registered Participants* or financially responsible participants.

(e) All *Metering Data Provider* exception reports must provide, for all instances where the *interval metering data* was found to be corrupted, an indication of the subsequent actions undertaken by the *Metering Data Provider*. 
S7A.7.13.3 Validation within the meter reading process for manually read metering installations

Validations during collection of interval metering data

(a) The validations to be performed by Metering Data Providers responsible for the collection of interval metering data from manually read metering installations are as follows:

1. the meter serial number matches the recorded meter serial number;
2. the security of the metering installation is intact, for example, meter seals are in place and in good order;
3. the time synchronisation of the metering installation is correct to ACST inclusive of any load control devices.

Validations during collection of accumulated metering data

(b) The validations to be performed by Metering Data Providers responsible for the collection of accumulated metering data are as follows:

1. the value of metering data from the current meter reading ≥ the value of metering data from the previous meter reading;
2. the value of metering data from the current meter reading is valid against an expected minimum value;
3. the value of metering data from the current meter reading is valid against an expected maximum value;
4. the meter serial number matches the recorded meter serial number;
5. the security of the metering installation is intact, for example, meter seals are in place and in good order;
6. the time synchronisation of the metering installation is correct to ACST inclusive of any load control devices;
7. the dial capacity is checked against the recorded dial capacity.

S7A.7.13.4 Validation as part of the registration process

General requirements

(a) Metering Data Providers must confirm information about the NMI is provided to NTESMO, where this is required in accordance with clause 7A.10.1, after any installation or change to a metering installation prior to the provision of any metering data to NTESMO or Registered Participants for the purposes of settlements.

Validation of metering data from remotely read metering installations

(b) Metering Data Providers must carry out the following validations after any installation or change to a metering installation with remote acquisition of metering data prior to the distribution of any interval metering data to NTESMO, Registered Participants or financially responsible participants for the purposes of settlements or billing transactions:
(1) for instrument transformer connected metering installations, the metering installation is recording metering data correctly, in conjunction with the Metering Provider;

(2) for whole current metering installations, the metering data correctly pertains to the registered metering installation;

(3) all data streams are captured.

Validation of interval metering data from manually read metering installations

(c) The Metering Data Provider must carry out the following validations in conjunction with the Metering Provider for manually read interval metering installations after any changes to a metering installation prior to the provision of any interval metering data to NTESMO, Registered Participants or financially responsible participants for the purposes of settlements or billing transactions:

(1) the metering data correctly pertains to the registered metering installation;

(2) all data streams are captured.

Validation of accumulated metering data from manually read metering installations

(d) Metering Data Providers must carry out the following validations, following any changes to a metering installation and prior to the provision of any accumulated metering data to NTESMO, Registered Participants or financially responsible participants for the purposes of settlements or billing transactions:

(1) the metering data correctly pertains to the registered metering installation;

(2) all data streams are captured.

Validation of type 7 metering installations

(e) Metering Data Providers must validate the calculated metering data on registration of all metering installations to verify that the inventory tables, load tables and on/off tables are complete and correct for the specifics of the metering installation.

S7A.7.13.5 Validation of metering data

General

(a) For metering installations with remote acquisition installed in accordance with paragraph 7A.6.8(a), the Metering Data Provider may perform validation in accordance with clauses S7A.7.14.4 and S7A.7.14.5, instead of clause S7A.7.14.2.
Validations for remotely read metering installations

(b) Metering Data Providers must, as a minimum, undertake the following validations within the metering data services database for metering installation types with remote acquisition of metering data:

1. a check of all interval metering data against a nominated maximum value:
   (i) this validation is to ensure that erroneous interval metering data spikes are trapped and substituted;
   (ii) this check may additionally be performed in the polling software;

2. a check of the maximum value of active energy and reactive energy:
   (i) for current transformer metering installations, the maximum value is to be initially determined by the connected current transformer ratio of the metering installation;
   (ii) for whole current metering installations the maximum rating of the meter is to be used;

3. a check against a nominated minimum value or, alternatively, a 'zero' check that tests for an acceptable number of zero intervals values per day to be derived from the site's historical metering data;

4. a check for null (no values) metering data in the metering data services database for all data streams:
   (i) the aim of this check is to ensure that there is a 100% metering data set (and substitution for any missing interval metering data is undertaken);
   (ii) the minimum check required is to ensure that there is at least one non-null active energy or reactive energy value per interval per metering data stream;

5. a check for the meter alarms referred to in clause S7A.7.13.2 and ensure:
   (i) that a process is in place that captures these meter alarms within the validation and ensures that any meter alarm occurrences are retained as part of the metering data audit trail;
   (ii) the provision of details of the occurrences of meter alarms to relevant Registered Participants within the metering data file in accordance with the MDFF Specification.

Validations for metering installations with checking metering or partial check metering

(c) Metering Data Providers must undertake the following validations by comparing the metering data and check metering data for all metering installations that have associated check metering installations or partial check metering installations:

1. for metering installations where the check metering installation duplicates the metering installation accuracy, the Metering Data
Provider must validate the metering installation data streams and check metering data streams on a per interval basis, and the average of the two validated metering data sets will be used to determine the energy measurement;

(2) for installations where the check metering data validation requires a comparison based on nodal balance (comparing the sum energy flow to the busbar against energy flow from the busbar):

(i) the Metering Data Provider must construct a validation algorithm within the metering data services database that will facilitate comparison of interval metering data for each energy flow on a per interval basis;

(ii) the Metering Data Provider must conduct an analysis of the historical metering data for each connection point to ascertain whether error differences in nodal balance are acceptable;

(iii) the Metering Data Provider should use this information to refine its validation algorithms to minimise the error difference for each connection point, based on historical metering data;

(iv) the maximum error difference considered acceptable for any connection point is 1% on a per interval basis, and the Metering Data Provider should minimise this for each connection point, based on historical metering data;

(3) where the check metering installation is remote from the metering installation (for example, at the other end of a transmission line or the other side of a transformer):

(i) the Metering Data Provider must construct a validation algorithm within the metering data services database that will facilitate comparison of interval metering data from the metering installation and the check metering installation on a per interval basis with adjustment for respective transformer or transmission line losses;

(ii) the Metering Data Provider must conduct an analysis of the historical metering data for each connection point to ascertain whether the error differences between the metering data from the metering installation and check metering installation are acceptable;

(iii) the Metering Data Provider should use this information to refine its validation algorithms to minimise the error difference for each connection point, based on historical metering data;

(iv) the maximum error difference considered acceptable for any connection point is 5% on a per interval basis, and the Metering Data Provider should minimise this for each connection point, based on historical metering data;

(4) for connection points where SCADA data is made available by NTESMO for the purposes of validation, the Metering Data Provider must validate the metering data by comparison of the interval
metering data against the SCADA data as provided by NTESMO in the agreed format:

(i) the Metering Data Provider must construct a validation algorithm within the metering data services database that will facilitate comparison of interval metering data from the metering installation and the SCADA data on a per interval basis;

(ii) the Metering Data Provider must conduct an analysis of the historical metering data for each connection point to ascertain whether error differences between the interval metering data from the metering installation and the SCADA data are acceptable;

(iii) the Metering Data Provider should use this information to refine its validation algorithms to minimise the error difference value for each connection point, based on historical metering data;

(iv) the Metering Data Provider must construct an appropriate validation algorithm as the SCADA data may be derived from a different measurement point, have a different interval collection period or have a different base unit of measurement, (for example, power not energy value) with allowances for a larger error of measurement;

(5) the Metering Data Provider is only required to undertake validation of metering data against the SCADA data on the primary data channel i.e. only 'B' channel validation where the financially responsible participant is a Generator and only 'E' channel validation for loads, such as pumps.

Validations for interval metering data from manually read metering installations with current transformers

(d) Metering Data Providers must, as a minimum, undertake the following validations on interval metering data from manually read metering installations with current transformers within the metering data services database:

(1) a check of all interval metering data against a nominated maximum value:

(i) this validation is to ensure that erroneous interval metering data spikes are trapped and substituted;

(ii) this check may additionally be performed in the collection software;

(2) a check of the maximum value of active energy, which must initially be determined by the connected current transformer ratio of the metering installation(maximum reactive energy checks may also be performed as an option);

(3) a check against a nominated minimum value or, alternatively, a 'zero' check that tests for an acceptable number of zero interval values per day to be derived from the site's historical metering data;
(4) a check for null (no values) metering data in the metering data services database for all metering data streams:
   (i) the aim of this check is to ensure that there is a 100% metering data set (and that substitution for any missing interval metering data is undertaken);
   (ii) the minimum check required is to ensure that there is at least one non-null active energy or reactive energy value per interval per metering data stream;

(5) a check for meter alarms referred to in clause S7A.7.13.2 and ensure that:
   (i) a process is in place that captures these meter alarms within the validation and ensures that any meter alarm occurrences are retained as part of the metering data audit trail; and
   (ii) the relevant Registered Participants are notified of the occurrences of these meter alarms within the metering data file in the MDFF specification;

(6) where supported by the meter(s), validation for a given period of interval metering data by comparison of the totalised interval energy data (accumulation register reading) and the change in the meter cumulative registers (energy tolerance); it is acknowledged that this check would not identify current transformer ratio changes that have occurred after initial commissioning and have not been advised to the Metering Data Provider;

(7) a check of the metering data for continuity and reasonability over the meter reading period:
   (i) check that no gaps in the metering data exist;
   (ii) check that metering data for the expected period has been delivered based on the scheduled meter reading date.

Validations for interval metering data from whole current manually read metering installations

(e) Metering Data Providers must, as a minimum, undertake the following validations on metering data from whole current manually read interval metering installations within the metering data services database:

(1) a check of all interval metering data against a nominated maximum value:
   (i) this validation is to ensure that erroneous interval metering data spikes are trapped and substituted;
   (ii) this check may additionally be performed in the collection software;

(2) a check of the maximum value of active energy (maximum reactive energy checks may also be performed as an option), and the maximum value is to be initially set to the rating of the meter;
(3) a check for null (no values) metering data in the metering data services database for all metering data streams:
   (i) the aim of this check is to ensure that there is a 100% metering data set (and that substitution for any missing interval metering data is undertaken);
   (ii) the minimum check required is to ensure that there is at least one non-null active energy or reactive energy value per interval per metering data stream;

(4) a check for meter alarms referred to in clause S7A.7.13.2 and the Metering Data Provider is not required to validate the interval metering data for power outage or power failure alarms, but must ensure that:
   (i) a process is in place that captures these meter alarms within the validation and ensures that any meter alarm occurrences are retained as part of the metering data audit trail;
   (ii) the relevant Registered Participants are notified of the occurrences of these meter alarms within the metering data file in accordance with the MDFF specification;

(5) where supported by the meter(s), validation for a given period of interval metering data by comparison of the totalised interval energy data (accumulation register reading) and the change in the meter cumulative registers (energy tolerance);

(6) a check of the metering data for continuity and reasonability over the meter reading period:
   (i) check that no gaps in the metering data exist;
   (ii) check that metering data for the expected period has been delivered based on the scheduled meter reading date.

Validations for accumulation metering data from manually read metering installations

(f) Metering Data Providers must undertake the following validations within the metering data services database for metering installations with accumulated metering data:

(1) a check against a nominated minimum value of metering data collected from the metering installation;

(2) a check against a nominated maximum value of metering data collected from the metering installation, and this is to be applied to both the metering data collected from the metering installation and the calculated energy consumption values;

(3) the current value of metering data collected from the metering installation ≥ previous value of metering data collected from the metering installation;

(4) the current value of metering data collected from the metering installation is numeric and ≥ 0;
(5) the current date that metering data is collected from the metering installation > the previous date that metering data was collected from the metering installation;

(6) a check for null (no values) metering data in the metering data services database for all metering data streams, and the aim of this check is to ensure that there is a 100% metering data set and substitution for any missing metering data is undertaken.

Validations for type 7 metering installations

(g) Metering Data Providers must undertake the following validations of calculated metering data within the metering data services database:

(1) a check against a nominated maximum calculated metering data value;

(2) for subparagraph (1), calculated metering data value is numeric and ≥ 0;

(3) a check for null (no values) calculated metering data for all metering data streams, and the aim of this check is to ensure that there is a 100% calculated metering data set (and substitution for any missing calculated metering data has been undertaken);

(4) a check of the inventory tables, load tables and on/off tables using a process approved by the Metering Coordinator to ensure that the correct version of these tables is being used for the production of calculated metering data;

(5) a check against a nominated minimum value, or alternatively, a 'zero' check that tests for an acceptable number of zero Interval values per day;

(6) calculated metering data date > previous calculated metering data date.

S7A.7.14 Determination of metering data for unmetered loads

Note
Obligations for determination of metering data for unmetered load, including requirements and methodologies for calculating metering data and associated responsibilities, will be considered in the event of a type 7 metering installation being available in this jurisdiction and after a 12 month transitional period allowing all participants to achieve compliance.

S7A.7.14.1 Load table

Note
Responsibility for developing, maintaining and publishing the load table will be considered in the event of a type 7 metering installation being available in this jurisdiction and after a 12 month transitional period allowing all participants to achieve compliance.

(a) The load table must set out:

(1) for each controlled unmetered device, its load (which includes any associated control gear, in watts) for use in calculating interval metering data in accordance with clause S7A.7.14.2; and
(2) for each uncontrolled unmetered device, its annual energy consumption in accordance with clause S7A.7.14.3. The annual energy consumption is used to calculate the calculated device wattage (in watts) which is used to calculate the interval metering data for each device type as follows:

\[
\text{[Calculated device wattage] = \frac{[device annual energy consumption]}{365 \times 24}}
\]

Where \( i \) = Uncontrolled unmetered device type \( i \).

(b) Proposals to add a new unmetered device load to the load table must include load measurement tests conducted by a NATA accredited laboratory or an overseas equivalent.

(c) Agreement for an unmetered device load to be added to the load table does not replace any obligation for an interested party to obtain appropriate approvals related to the performance and acceptance of use of the unmetered device.

S7A.7.14.2 Controlled unmetered devices

Metering data calculation

(a) The Metering Coordinator must ensure that the interval metering data for controlled unmetered devices classified as a type 7 metering installation are calculated in accordance with the following algorithm:

\[
\text{Interval metering data for TI}_j \text{ for NMI} (\text{in watt hours}) = \sum_{k=1}^{n} (\text{Device wattage}_i) \times (\text{Device count for NMI}_i) \times (\text{Period load is switched on})_j \times (\text{Recording interval})
\]

where:

\( i \) = device type

\( j \) = TI

\( k \) = proportion of device attributable to that NMI

TI is in minutes.

Unmetered device wattage/device wattage is determined from the load table.

Unmetered device count/device count is determined from the inventory table.

Period load is switched on is determined from the on/off table.

Inventory table

(b) For each NMI, a separate inventory table is required that identifies each unmetered device type that forms part of the load and for each unmetered device type lists:

(1) the unmetered device type;

(2) the form of on/off control – photoelectric cell control, timer control, ripple control or other control;
(3) if timer control or ripple control, the on/off times for the timer control or the ripple control system;
(4) if other control, the on/off times;
(5) if an unmetered device is shared with another NMI, the proportion of load that is agreed by affected Registered Participants to be attributable to that NMI (k), and each k factor will be less than 1 and the sum of the k factors for a shared unmetered device across each respective NMI must be equal to 1;
(6) if an unmetered device is not shared with another NMI, the k factor must be equal to 1;
(7) the number of such unmetered devices installed;
(8) the effective start date – the first day on which that record in the inventory table is to be included in the calculation of metering data for that NMI;
(9) the effective end date – the last day on which that record in the inventory table is to be included in the calculation of metering data for that NMI; and
(10) the last change date – the date that record in the inventory table was most recently created or modified.

(c) Each unmetered device in the inventory table is a unique combination of physical hardware, time control classification and shared portion. For example, if an unmetered device is shared with another NMI, the individual portions of the unmetered device(s) must be included in the inventory table as a separate unmetered device type on each NMI.

(d) Each Metering Coordinator must develop the initial inventory table for the NMIs for which it is responsible. The initial inventory table must be agreed by each affected Registered Participant and the relevant end user.

(e) Each Metering Coordinator must update the inventory table for the NMIs for which it is responsible on at least a monthly basis to ensure that the accuracy requirements in clause S7A.7.6.2 are met. Any changes to the inventory table may only be made on a retrospective basis where:
(1) agreed by the Metering Coordinator and the affected Registered Participants; or
(2) necessary to comply with clause 7A.7.4.

(f) The Metering Coordinator must communicate any material changes to the inventory table to the affected Registered Participants.

(g) The Metering Coordinator must provide the inventory table to relevant Registered Participants when requested.

On/off table

(h) The form of on/off control may be:
(1) photoelectric;
(2) timer control, or ripple control; or
(3) other control.

Photoelectric cell control

(i) The Metering Coordinator must ensure that the appropriate sunset times and sunrise times are obtained from the Australian Government Geoscience website (www.ga.gov.au/geodesy/astro/sunrise.jsp), based on the longitude and latitude of the relevant town and Australian Central Standard Time.

(j) The Metering Coordinator must ensure that the period that the load is switched on during a recording interval is calculated as follows:

<table>
<thead>
<tr>
<th>Recording interval</th>
<th>Period load is switched on</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the recording intervals commencing after sunset and finishing prior to sunrise</td>
<td>Period load is switched on = 1</td>
</tr>
<tr>
<td>For the recording intervals commencing after sunrise and finishing prior to sunset</td>
<td>Period load is switched on = 0</td>
</tr>
<tr>
<td>For the recording interval during which the sunset occurs</td>
<td>( (\text{Period load is switched on}) = \frac{(\text{End time of recording interval}) - (\text{Time of sunset})}{30} )</td>
</tr>
<tr>
<td>For the recording interval during which the sunrise occurs</td>
<td>( (\text{Period load is switched on}) = \frac{(\text{Time of sunset}) - (\text{Start time of recording interval})}{30} )</td>
</tr>
</tbody>
</table>

Timer control

(k) If the on/off times for an unmetered device is controlled by a timer or ripple injection system:

(1) On time = ON time set on timer or ripple injection system;
(2) Off time = OFF time set on timer or ripple injection system.

(l) The Metering Coordinator must ensure that the period that the load is switched on during a recording interval is calculated as follows:

<table>
<thead>
<tr>
<th>Recording interval</th>
<th>Period load is switched on</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the recording intervals commencing after on time and finishing prior to off time</td>
<td>Period load is switched on = 1</td>
</tr>
<tr>
<td>For the recording</td>
<td>Period load is switched on = 0</td>
</tr>
</tbody>
</table>
### Recording interval

<table>
<thead>
<tr>
<th>intervals commencing after off time and finishing prior to on time</th>
<th>Period load is switched on</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the <em>recording interval</em> during which the on time occurs</td>
<td>[(\text{Period load is switched on}) = \frac{(\text{End time of recording interval}) - (\text{On time})}{30}]</td>
</tr>
<tr>
<td>For the <em>recording interval</em> during which the off time occurs</td>
<td>[(\text{Period load is switched on}) = \frac{(\text{Off time}) - (\text{Start time of recording interval})}{30}]</td>
</tr>
</tbody>
</table>

**Other control**

(m) Where the on/off times for an unmetered device are not in accordance with paragraphs (i) to (m), the following alternative forms of control may be used:

1. On time = sunset time + ON delay or ON time set on timer or ripple injection system;
2. Off time = sunrise time + OFF delay or OFF time set on timer or ripple injection system or a fixed duration after ON time.

(n) Where sunrise or sunset times are used, the time is determined in accordance with paragraph (j).

(o) The *Metering Coordinator* must ensure that the period that the *load* is switched on during a *recording interval* is calculated as follows:

<table>
<thead>
<tr>
<th>Recording interval</th>
<th>Period load is switched on</th>
</tr>
</thead>
<tbody>
<tr>
<td>For the <em>recording intervals</em> commencing after on time and finishing prior to off time</td>
<td>Period load is switched on = 1</td>
</tr>
<tr>
<td>For the <em>recording intervals</em> commencing after off time and finishing prior to on time</td>
<td>Period load is switched on = 0</td>
</tr>
<tr>
<td>For the <em>recording interval</em> during which the on time occurs</td>
<td>[(\text{Period load is switched on}) = \frac{(\text{End time of recording interval}) - (\text{On time})}{30}]</td>
</tr>
<tr>
<td>For the <em>recording</em></td>
<td>(Period load is switched on) =</td>
</tr>
</tbody>
</table>
**S7A.7.14.3 Uncontrolled unmetered devices**

(a) [Not used]

**Energy calculation**

(b) The *Metering Coordinator* must ensure that the *interval metering data* for other unmetered *loads*, which have been classified as a type 7 metering installation, is calculated in accordance with the following algorithm:

\[ \sum_{j=1}^{k}(k) \times \text{(Device wattage)}_j \times \text{(Device count for NMI)}_j \times \left( \frac{\text{(Period load is switched on)}}{30} \right) \times \text{(Recording interval)} \]

**Inventory table**

(c) For each *NMI*, a separate inventory table is required that identifies each device type that forms part of the *NMI load* and for each device type lists:

1. the device type;
2. the form of on/off control (24 hours per day);
3. if a device is shared with another *NMI*, the proportion of *load* that is agreed by relevant financially responsible participants to be attributable to that *NMI*(*k*), and each *k* factor will be less than 1 and the sum of the *k* factors for a shared unmetered device across each respective *NMI* must be equal to 1;
4. if a device is not shared with another *NMI*, the *k* factor must be equal to 1;
5. the number of such devices installed;
6. the effective start date – the first day on which that record in the inventory table is to be included in the calculation of *metering data* for that *NMI*;
7. the effective end date – the last day on which that record in the inventory table is to be included in the calculation of *metering data* for that *NMI*; and
8. the last change date – the date that record in the inventory table was most recently created or modified.

(d) Each device in the inventory table is a unique combination of physical hardware, time control classification and shared portion. For example, if a device is shared with another *NMI*, the individual portions of the device(s) must be included in the inventory table as a separate device type on each *NMI*.

(e) Each *Metering Coordinator* must develop the initial inventory table for the *NMIs* for which it is responsible. The initial inventory table must be agreed
by the relevant financially responsible participants and the relevant end-use customer.

(f) Each Metering Coordinator must use reasonable endeavours to update the inventory table, for the NMIs for which it is responsible, on at least a monthly basis for any additions, deletions and modifications to ensure that the accuracy requirements in clause S7A.7.6.2 are met. Such additions, deletions or modifications to the inventory table may only be made on a retrospective basis where:

(1) agreed by the Metering Coordinator and the relevant financially responsible participants; or

(2) necessary to comply with clause 7A.7.6.

(g) The Metering Coordinator must communicate any material changes to the inventory table to the relevant financially responsible participants.

(h) The Metering Coordinator must provide the inventory table to relevant financially responsible participants when requested.

On/off table

(i) Other unmetered loads are assumed to operate 24 hours per day.

(j) For each recording interval period load is switched on = 1.

Schedule 7A.8 Service level procedures

Part A Introduction

S7A.8.1 Introduction

S7A.8.1.1 Purpose and scope

(a) This schedule applies to Metering Providers and Metering Data Providers.

(b) This schedule sets out:

(1) the requirements for the provision, installation and maintenance of metering installations by Metering Providers;

(2) requirements for the systems and processes for the collection, processing and delivery of metering data by Metering Data Providers;

(3) the performance levels associated with the collection, processing and delivery of metering data;

(4) the data formats that must be used for the delivery of metering data;

(5) the requirements for the management of relevant NT NMI Data; and

(6) the requirements for the processing of metering data associated with connection point transfers and the alteration of metering installations where one or more devices are replaced.

S7A.8.1.2 Definitions

In this schedule:
collect, collection, collected mean a process undertaken by the Metering Data Provider to obtain metering data from a meter or metering installation.

Service Providers means Metering Data Providers, Metering Providers and Local Network Service Providers.

Part B Metering provider services

S7A.8.2 Introduction

S7A.8.2.1 Purpose and exclusions

(a) Part B of this schedule:

(1) details the obligations, technical requirements, measurement process and performance requirements that are to be performed, administered and maintained by a Metering Provider;

(2) details the obligations and technical/operational requirements in the provision, installation and maintenance of the metering installation by a Metering Provider;

(3) relates to Metering Providers who undertake the provision, installation and maintenance of various metering installation types as stipulated; and

(4) sets out minimum requirements for Metering Providers.

(b) For service provision at connection points where:

(1) the Metering Provider and the Metering Data Provider are part of the same company; and

(2) metering installation provision or maintenance work is performed using internal processes and procedures, those internal processes and procedures will be deemed to be compliant with this Part if the metering work satisfies the performance and quality outcomes of this Part.

S7A.8.2.2 Services

The Metering Provider is responsible for the provision of metering provision services, including but not limited to:

(a) maintaining the ongoing metering installation compliance with the Rules;

(b) the provision and maintenance of physical metering installation security controls;

(c) the provision, installation and maintenance of the metering installation;

(d) the maintenance of metering installation password security; and

(e) the development and maintenance of an Asset Test Plan.

S7A.8.3 General requirements

S7A.8.3.1 Metering Provider capability and competency

Metering Providers must:
(a) employ personnel with the skills, knowledge and expertise necessary for the discharge of the responsibilities under Chapter 7A and have procedures for ensuring that personnel maintain their knowledge and understanding of the requirements of the Rules;

(b) maintain a register of employees, which for each employee must include:
   (1) skills, knowledge and expertise;
   (2) qualifications, registrations and accreditations where applicable to the discharge of Metering Provider duties;
   (3) training undertaken and planned;
   (4) authorisations to provide opinions and interpretations of technical information; and
   (5) authorisations to access metering installations within secure and restricted areas;

(c) have policies and procedures for making statements of opinions and interpretations, documented within the quality system;

(d) comply with:
   (1) AS 3000 Wiring Rules;
   (2) applicable Australian Communications and Media Authority (ACMA) communications and cabling requirements; (3) C-Tick compliance requirements;
   (4) jurisdictional legislation, including safety legislation and regulations; and
   (5) any reasonable requirements of the Local Network Service Provider when working on or around Local Network Service Provider.

S7A.8.3.2 Use of contractors

Where a Metering Provider engages a sub-contractor to perform any of its obligations specified in the Rules, the Metering Provider:

(a) must have policies and procedures for assessing the sub-contractor's capability, competency and processes, procedures and systems, to ensure that they are compliant with the Rules;

(b) must ensure that auditable processes are in place to certify that all work performed by the sub-contractor complies with the Rules;

(c) remains liable for all acts and omissions of any sub-contractor; and

(d) must authorise the sub-contractor to provide any specific opinion or interpretation of technical information.

S7A.8.3.3 Insurance

The Metering Provider must:

(a) hold public liability insurance for an amount not less than $10,000,000 per occurrence;
(b) hold professional indemnity insurance for an amount of not less than $1,000,000 per occurrence; and

(c) provide the Utilities Commission with certified current copies of insurance policies on request.

Note
If a Metering Data Provider, Metering Provider and Metering Coordinator are the same legal entity, a single insurance policy for public liability insurance for an amount not less than $10,000,000 per occurrence and professional indemnity insurance for an amount of not less than $1,000,000 per occurrence that covers the operations of the Metering Data Provider, Metering Provider and Metering Coordinator roles will satisfy the insurance requirements under this schedule.

S7A.8.4 Device management and test equipment

S7A.8.4.1 Procurement

The Metering Provider must have processes and systems in place for the procurement of meters, instrument transformers and any other devices that can be installed by the Metering Provider within a metering installation, and ensure that metering installation components are suitable for use in accordance with the Rules.

S7A.8.4.2 Storage, handling and transport

(a) The Metering Provider must have processes that are consistent with good industry practice, specifying the requirements for storage, handling (including packaging) and transport (including return to owner) of any equipment that is calibrated including meters, instrument transformers and test equipment. The processes must be designed to:

(1) minimise the risk of physical or environmental damage to the equipment; and

(2) identify conditions under which the physical condition of the equipment or accuracy is compromised as a result of storage, transport or handling.

(b) The Metering Provider must ensure that meters, instrument transformers and devices removed from the metering installation are returned to their owner within 10 business days following their removal, unless otherwise agreed with the owner.

S7A.8.4.3 Management of test equipment

The Metering Provider must:

(a) establish a register of test equipment used for testing metering installations, meters and instrument transformers;

(b) maintain records of test equipment, including records of calibration certificates, for at least 7 years from the issue date of the calibration certificate;

(c) ensure that all test equipment is calibrated by a NATA accredited testing laboratory holding ISO 9001 and 17025 accreditation for the calibration of test equipment, current at the time of calibration; and
(d) ensure that all tests are undertaken with test equipment where the calibration certificate is current and stated calibration due date has not passed.

**S7A.8.4.4 Management of meter programming and authorised software**

The *Metering Provider* must:

(a) establish a register of equipment and authorised software used for programming *meters*; and

(b) maintain records of equipment, authorised software and programs used for programming *meters*, including any changes to firmware or software within the *meter*, for at least 7 years from the most recent date of use.

**S7A.8.5 Installation and commissioning requirements**

**S7A.8.5.1 General commissioning requirements**

The *Metering Provider* must develop, maintain and operate processes and procedures for the installation and commissioning of *metering installations* for which they are accredited, which must include installation and verification requirements to ensure that:

(a) electrical wiring at the *metering installation* is:

   (1) wired and terminated in compliance with *meter* and *instrument transformer* manufacturer requirements, relevant *Australian Standards* and jurisdictional requirements;

   (2) terminated in a manner that ensures no electrical conductors are exposed, that the cable type and size, and number of cables terminated in any one termination are appropriate and that all terminations are tight;

   (3) of an appropriate cable type, size and insulation that meets the requirements of *AS 3000*;

   (4) connected with the correct polarity at each termination and connection; and

   (5) connected with the correct phase sequence, where three phases are connected at the *metering installation*; in the case of a change to an existing *metering installation*, the existing phase sequence is maintained;

(b) the accuracy class of *metering installations* and any documentation from a certified body verifying the errors of *meters* and *instrument transformers* comply with the *Rules*;

(c) nameplate information reflects the design accuracy class of the *meters* and *instrument transformers*;

(d) the actual connected ratios of all *instrument transformers* at a *metering installation* and the calculation of the constant to be applied to the collection and processing of *metering data* by the *Metering Data Provider* are aligned;

(e) burdens applied to *instrument transformers* are within the rated burden specified on the name plate of the *instrument transformer*;
(f) voltage phase sequence relationships are correct unless the Metering Provider can verify to the satisfaction of NTESMO the accuracy of the metering installation when a non-standard phase sequence is applied;

(g) the combined current and voltage phase relationships at the meter terminals are correct;

(h) the meter programming parameters, display and error functions are all correct in accordance with manufacturer specifications, including the measurement of the forward rotation of energy applied to the meter, and that the correct pulse rates have been programmed into the meter;

(i) where the metering installation includes instrument transformers, register readings are validated by use of a load being placed on the load side of the metering installation and may include a timing check by comparing the readings on the meter display or pulse indicators against load and time;

(j) where the metering installation has meter alarms, occurrences of alarms identified on commissioning are investigated and resolved prior to leaving the site;

(k) where an aerial or antenna is installed as part of the metering installation, it is installed in accordance with the manufacturer's instructions and in a manner that maintains the integrity of the meter enclosure, including water and environmental seals; and

(l) the time setting of the metering installation is referenced in accordance with clause 7A.8.8.

S7A.8.5.2 Metering data validation requirements

The Metering Provider must develop, maintain and operate processes and procedures for the validation of interval metering data with the Metering Data Provider on the installation or alteration of that metering installation, which must include processes to ensure that:

(a) metering data is validated in accordance with schedule S7A.7;

(b) where validation has failed or cannot reasonably be undertaken, the Metering Provider informs the Metering Data Provider and the Metering Coordinator that the metering installation cannot be validated and undertake wiring checks which visibly verify correct connection and phase relationships of voltage and current circuits and also undertake one or more of the following alternative measurements and commissioning checks to enable the Metering Coordinator and Metering Provider to confirm that the metering installation complies with the Rules:

(1) utilisation of meter energy measurement to calculate load demand and that this value is reflective of expected magnitude;

(2) use of a dummy load or phantom load box to verify correct energy measurement at the metering installation; and

(3) compare meter measurement of energy or load with an alternative measurement of demand, current and other measurements of electrical energy;
(c) Where the Metering Provider has undertaken in-situ testing to verify correct energy measurement at the metering installation, the Metering Provider informs the Metering Data Provider of the start and end times of the test to facilitate the Metering Data Provider substituting and validating metering data.

S7A.8.6 Metering installation maintenance

S7A.8.6.1 Test plans

(a) The Metering Provider must develop and maintain Asset Test Plans that provide confirmation of the Metering Provider's testing approach to ensure metering installations are maintained:
   (1) in accordance with the testing and inspection requirements of the Rules;
   (2) in accordance with approved Asset Management Strategies; or
   (3) in any combination of the above.

(b) As a minimum, the Metering Provider's Asset Test Plans must include:
   (1) the approach to testing and inspecting for each metering installation, or groups of metering installations;
   (2) where appropriate, the approach to testing and inspecting various device types; and
   (3) the details of the test equipment and test methodology to be employed in undertaking works considered in the test plan.

S7A.8.6.2 Management of metering installation malfunctions

(a) The Metering Provider must have processes and systems to support the Metering Coordinator in identifying and rectifying a metering installation malfunction in the timeframes specified in clause 7A.6.9.

(b) Where a Metering Provider identifies a metering installation malfunction, the Metering Provider must advise the Metering Data Provider and the Metering Coordinator within 1 business day of identification in accordance with paragraph 7A.6.9(d).

S7A.8.6.3 Telecommunications

(a) The Metering Provider must advise the Metering Data Provider and the Metering Coordinator if communications equipment is to be temporarily disconnected such that it may affect the remote acquisition of metering data.

(b) The Metering Provider must use reasonable endeavours to assist the Metering Coordinator and the Metering Data Provider with the manual collection of metering data from the metering installation where remote acquisition becomes unavailable.
S7A.8.6.4 Non-conforming test results or calibrations

The Metering Provider must have a process for the management of non-conforming test results or calibrations at a metering installation, and for devices removed from a metering installation for testing and evaluation, which must include:

(a) a process to perform the evaluation of the non-conformance;
(b) authority for management of the non-conformance;
(c) notification of the non-conformance to parties affected by the non-conformance, which must include the Metering Coordinator, Metering Data Provider, financially responsible participant, Local Network Service Provider and NTESMO; and
(d) initiation of corrective action.

S7A.8.7 Systems and administration

S7A.8.7.1 Register of metering installations

(a) The Metering Provider must establish and maintain a register of metering installations which must include:

(1) the identity and characteristics of metering equipment (instrument transformers, metering installation and check metering installation), including:
   (i) serial numbers;
   (ii) metering installation identification name;
   (iii) metering installation types and models;
   (iv) instrument transformer ratios (available and connected);
   (v) current test and calibration programme details, test results and references to test certificates;
   (vi) asset management plan and testing schedule;
   (vii) calibration tables, where applied to achieve metering installation accuracy;
   (viii) Metering Provider(s) and Metering Data Provider(s) details;
   (ix) summation scheme values and multipliers; and
   (x) data register coding details;

(2) for metering installations for connection points in a market operated or administered by NTESMO—any matters identified by NTESMO in a communication guideline issued in from time to time accordance with clause S7A.1.3.

(b) The register must be retained electronically for at least 13 months for each metering installation from when the details of the metering installation are first recorded in the register and may be archived after this period.

(c) The register must be retained for at least 7 years for each metering installation from when the details of the metering installation are first
recorded in the register and any archiving retrieval mechanisms must facilitate analysis and management of information using the same processing rules applied to the electronic register.

d) The Metering Provider must provide information from their register of metering installations to a party authorised to receive data in accordance with clause 7A.13.5 in a timeframe agreed with that party.

S7A.8.7.2 Disaster recovery

(a) The Metering Provider must establish and maintain a disaster recovery plan and business continuity processes that include:

(1) detailed documentation that is maintained up to date, showing revisions and the date of the last review;

(2) confirmation at least annually by the Metering Provider's management that the plan is current for the systems and processes in place; and

(3) confirmation that the plan has been subjected to an annual end-to-end test that facilitates both a 'fail-over' from and 'recovery' back to the production system.

(b) In the event of an IT system failure, the Metering Provider must ensure that systems are returned to normal operational service within 5 business days of the failure, as evidenced by:

(1) the software and the most recent back-up of data being restored to operational service within the 5 business days; and

(2) no outstanding processing or delivery of NT NMI Data to NTESMO and Registered Participants.

(c) The Metering Provider must at its earliest opportunity notify NTESMO of any failure where the Metering Provider has a requirement to implement its disaster recovery plan.

S7A.8.7.3 Audits undertaken by the Utilities Commission

The Metering Provider must undertake all services in a manner that is auditable by the Utilities Commission and must provide all reasonable assistance to the Utilities Commission in discharging its obligations under the Rules and any relevant jurisdictional legislation in relation to metering installations.

Part C Metering Data Provider services

S7A.8.8 Introduction

S7A.8.8.1 Purpose

(a) The purpose of Part C of this schedule is to detail the obligations, technical requirements, measurement processes and performance requirements that are to be performed, administered and maintained by the Metering Data Provider.

(b) This Part details:
(1) the obligations of Metering Data Providers in the provision of metering data services;
(2) the obligations of Metering Data Providers to establish and maintain a metering data services database; and
(3) the obligations of Metering Data Providers in support of the Metering Coordinator.

S7A.8.8.2 Obligations

Metering data services
(a) Each Metering Data Provider must:
(1) provide metering data services in accordance with the Rules and relevant jurisdictional codes and policies;
(2) establish, maintain and operate a metering data services database;
(3) ensure that metering data is kept confidential and secure and only provided to persons entitled to have such access in accordance with the Rules;
(4) undertake the collection, processing and delivery of metering data and meter alarm occurrences; and
(5) co-operate in good faith with NTESMO, and all Registered Participants, Metering Providers and Metering Data Providers.

Insurance
(b) The Metering Data Provider must:
(1) hold public liability insurance for an amount not less than $10,000,000 per occurrence; and
(2) hold professional indemnity insurance for an amount of not less than $1,000,000 per occurrence.

Note
If a Metering Data Provider, Metering Provider and Metering Coordinator are the same legal entity, a single insurance policy for public liability insurance for an amount not less than $10,000,000 per occurrence and professional indemnity insurance for an amount of not less than $1,000,000 per occurrence that covers the operations of the Metering Data Provider, Metering Provider and Metering Coordinator roles will satisfy the insurance requirements under this schedule.

Use of sub-contactors
(c) Where a Metering Data Provider engages a sub-contractor to perform any of the Metering Data Provider's obligations specified in the Rules, the Metering Data Provider:
(1) must have policies and procedures for assessing the sub-contractor's capability, competency, processes, procedures and systems, to ensure that the sub-contractor complies with the Rules;
(2) must ensure that auditable processes are in place to certify that all work performed by the sub-contractor complies with the Rules;
(3) remains liable for all acts and omissions of its sub-contractor;

(4) must authorise the sub-contractor to provide any specific opinion or interpretation of technical information where a Metering Data Provider so engages a sub-contractor; and

(5) must provide the Utilities Commission, on request, with any information pertaining to the sub-contractor that the Utilities Commission reasonably considers necessary for the discharge of the Metering Data Provider's responsibilities under the Rules.

Specific obligations

(d) Each Metering Data Provider must:

(1) undertake validation, substitution and estimation of metering data in accordance with schedule S7A.7 Part C;

(2) provide metering data services;

(3) ensure registered details of the connection point are fully recorded in the Metering Data Provider's metering data services database;

(4) ensure metering details and parameters within the metering data services database are correct such that the metering data in the metering data services database is accurate;

(5) facilitate the timely commissioning and registration of the metering installation; and

(6) establish and maintain a metering register in its metering data services database.

Metering register

(e) Each Metering Data Provider must ensure that information in its metering register is:

(1) registered in co-operation with the Metering Coordinator and Metering Provider;

(2) provided on request to persons entitled to have access to that information in accordance with paragraph 7A.13.5(c);

(3) communicated to other Metering Data Providers having the right of access as a result of the transfer of a connection point;

(4) populated with the following:

(i) connection and metering point reference details, including:

(A) agreed locations and reference details (for example, drawing numbers);

(B) loss compensation calculation details;

(C) site identification names;

(D) details of financially responsible participants and Local Network Service Providers associated with the connection point;

(E) details of the Metering Coordinator;
(ii) the identity and characteristics of metering equipment (that is, instrument transformers, metering installation and check metering installation), including:

(A) serial numbers;

(B) metering installation identification name; (c) metering installation types and models;

(D) Metering Provider(s) and Metering Data Provider(s) details;

(E) summation scheme values and multipliers; and

(F) data register coding details;

(iii) for types 1, 2, 3 and 4 metering installations, data communication details, if relevant, including:

(A) telephone number(s) for access to energy data;

(B) communication equipment type and serial numbers;

(C) communication protocol details or references;

(D) data conversion details;

(E) user identifications and access rights; and

(F) 'write' password (to be contained in a hidden or protected field);

(iv) data validation, substitution and estimation processes agreed between affected parties, including:

(A) algorithms;

(B) data comparison techniques;

(C) processing and alarms (for example, voltage source limits; phase angle limits);

(D) check metering compensation details; and

(E) alternate data sources; and

(5) for metering installations for connection points in a market operated or administered by NTESMO, includes any relevant matters identified by NTESMO in a communication guideline issued from time to time in accordance with clause S7A.1.3.

S7A.8.9 Service requirements

S7A.8.9.1 System requirements

Each Metering Provider must maintain and operate a metering data services database to facilitate the:

(a) collection of metering data;

(b) processing, calculation, validation, substitution and estimation of metering data;

(c) delivery of metering data and metering register data to NTESMO, Registered Participants, financially responsible participants and other Service Providers;
(d) assignment and version control of participant roles for connection points;
(e) commissioning of each metering installation into the Metering Data Provider's metering data services database;
(f) loading of metering data relating to meter churn; and
(g) storage and archiving of metering data and validated metering data from the metering installation.

S7A.8.9.2 Metering data services database

Each Metering Data Provider must maintain and operate a metering data services database that provides a full audit trail and version control capability. This functionality must be applied to:

(a) metering data;
(b) assigned data quality flags;
(c) substitution and estimation types;
(d) meter alarms;
(e) metering register information;
(f) the delivery of metering data to Registered Participants, financially responsible participants and NTESMO; and
(g) the mapping of all metering data streams (including logical metering data streams).

S7A.8.9.3 Exception reports

Each Metering Data Provider must maintain, operate and monitor a system that supports the detection of system or process errors. These exception reports must include, but not be limited to:

(a) missed reads and missing intervals of metering data within the metering data services database;
(b) long term substitutions and estimations;
(c) metering data errors and data overlaps;
(d) validation or metering register errors;
(e) failed batch processing, database errors and hardware failures;
(f) the capture of file syntax errors, failed and rejected metering data deliveries;
(g) status management of collection interfaces; and
(h) status management of metering installation malfunctions.

S7A.8.9.4 Collection process requirements

(a) Each Metering Data Provider must use reasonable endeavours to ensure actual meter readings and occurrences of meter alarms are collected for all connection points.
(b) Each Metering Data Provider must operate a process that:
(1) records and logs faults and problems associated with the reading function of meters, and this process must record and log, but is not limited to, any:

(i) access problems;
(ii) metering installation security problems;
(iii) metering installation faults;
(iv) read failures; and
(v) metering installation time synchronisation errors; and

(2) supports the Metering Coordinator, the Metering Provider, or both, in the rectification of any metering installation malfunctions or problems associated with the reading function of meters.

(c) On request by the financially responsible participant, a Metering Data Provider must use reasonable endeavours to carry out a special meter reading or final reading within 3 business days of the receipt of the request unless an alternative timeframe has been agreed.

S7A.8.9.5 Specific collection process requirements for remotely read metering installations

(a) Each Metering Data Provider must be capable of initiating a remote acquisition for metering data from type 1 to 3 metering installations where relevant metering data is missing, erroneous or has failed validation.

(b) Each Metering Data Provider must operate and maintain a process that:

(1) initiates an alternative method to collect metering data where remote acquisition becomes unavailable; and

(2) provides a log detailing successful reading events for each metering installation, or alternatively an exception report of failed meter readings.

S7A.8.9.6 Specific collection process requirements for manually read metering installations

Each Metering Data Provider must:

(a) develop and maintain a meter reading schedule in accordance with Schedule 7A.7 Part B;

(b) maintain reading routes with particular attention to any specific access requirements and hazard information;

(c) use reasonable endeavours to ensure that metering data is collected at least once every 3 months;

(d) ensure that scheduled reading date lists and programmed reading equipment is provisioned, updated and maintained;

(e) use reasonable endeavours to ensure that metering data is collected within 2 business days prior to or 2 business days subsequent to a scheduled reading date; and
(f) ensure that all metering data collected and any fault reason codes associated with a reading failure are transferred to the metering data services database within 1 business day of the data being collected or attempted to be collected from the metering installation.

S7A.8.9.7 Metering data processing requirements

General

(a) Each Metering Data Provider must have a process to:

(1) confirm and utilise the roles for connection points;

(2) assign and store the date/time stamp of when the metering data was entered into the Metering Data Provider's metering data services database;

(3) ensure that all metering data is stored in the metering data services database with the correct:

   (i) quality flag;

   (ii) applicable substitution or estimation type code; and

   (iii) applicable substitution or estimation reason code;

(4) check the metering data services database for missing metering data and overlaps;

(5) aggregate interval metering data for a connection point into a 30-minute interval net metering data stream prior to delivery to NTESMO or financially responsible participants in accordance with the Rules;

(6) load metering data in an alternative format provided by a Metering Provider where there is a communications error, failed reading or metering installation malfunction that prevents the normal collection of metering data from a metering installation; and

(7) whenever any substitutions or estimations are carried out, notify:

   (i) NTESMO (in respect of a metering installation used for the purposes of settlements);

   (ii) Registered Participants for the connection point; and

   (iii) financially responsible participants (in respect of a metering installation used for the purposes of billing transactions).

Erroneous data

(b) Where the Metering Coordinator or Metering Provider informs a Metering Data Provider of a situation that may cause metering data to be erroneous, the Metering Data Provider must identify and substitute any erroneous metering data.

(c) Where any Registered Participant for the connection point disputes metering data, the Metering Data Provider must investigate, and, if necessary correct the metering data in accordance with Schedule 7A.7 Part C.
Meter alarms

(d) Where a meter alarm has occurred, the Metering Data Provider must process the occurrence of the meter alarm along with the metering data as part of the validation process in accordance with Schedule 7A.7 Part C.

S7A.8.9.8 Specific metering data processing requirements for type 1, 2, 3 and 4 metering installations

Each Metering Data Provider must be able to undertake simple cumulative or subtractive processes to manage complex metering configurations. Typically, the system must support:

(a) an A+B+C or A-B-C aggregation configuration;

(b) validation capability for standard partial or check meter connection points that incorporate a simple comparison of a single metering data stream to a single check metering data stream within an acceptable tolerance; and

(c) the calculation of the average of the 2 validated data sets for metering installations where the check metering installation duplicates the metering installation and accuracy level, and the average of the 2 validated data sets must be delivered to:

(1) NTESMO (in respect of a metering installation used for the purposes of settlements);

(2) Registered Participants; and

(3) financially responsible participants (in respect of a metering installation used for the purposes of billing transactions).

S7A.8.9.9 Specific metering data processing requirements for type 7 metering installations

Inventory tables, load tables and on/off tables

(a) Each Metering Data Provider must store inventory tables, load tables and on/off tables in the metering data services database.

(b) Each Metering Data Provider must ensure:

(1) inventory tables are complete, correct and updated with any changes provided by the Local Network Service Provider or Metering Coordinator;

(2) on/off tables are complete and correct; and

(3) load tables are complete and correct.

(c) Each Metering Data Provider must ensure the inventory table, load table and on/off table are versioned for metering data calculations.

Processing of calculated metering data

(d) Each Metering Data Provider must ensure that all calculated metering data is validated and processed into recording intervals.
S7A.8.9.10 Specific metering data estimation requirements for manually read and type 7 metering installations

(a) Each Metering Data Provider must have a process for the creation of estimated metering data for type 4A, 5, 6 and 7 metering installations.

(b) To meet metering data delivery requirements, this process must either:

(1) create individual blocks of estimated metering data on a daily basis; or

(2) create a single block of estimated metering data:

   (i) from the date of the last meter reading to a period beyond the next scheduled reading date for type 4A, 5 and 6 metering installations; or

   (ii) from the date of the last calculation to a period beyond the next scheduled calculation for type 7 metering installations.

S7A.8.9.11 Delivery performance requirements for metering data

Obligation to deliver information to NTESMO

(a) Where this clause S7A.8.9.11 imposes an obligation on a Metering Data Provider to deliver metering data or other information to NTESMO, that obligation only applies in respect of a metering installation that is used for the purposes of settlements.

Obligation to deliver information to financially responsible participants

(b) Where this clause S7A.8.9.11 (other than paragraph S7A.8.9.11(e)) imposes an obligation on a Metering Data Provider to deliver metering data or other information to financially responsible participants, that obligation only applies in respect of a metering installation that is used for the purposes of billing transactions.

Validated metering data to be delivered

(c) Each Metering Data Provider must ensure only validated metering data is delivered to NTESMO, Registered Participants and financially responsible participants.

Delivery timing requirements

(d) Subject to any agreement to the contrary as contemplated by clause S7A.8.13.1, each Metering Data Provider must:

   (1) deliver to NTESMO, Registered Participants and financially responsible participants all actual meter readings that passed validation within 2 business days of the actual meter readings being received into the metering data services database;

   (2) substitute, validate and deliver to NTESMO, Registered Participants and financially responsible participants the substituted metering data within 2 business days of the actual meter readings being received into the metering data services database and failing validation;
(3) substitute, validate and deliver to NTESMO, Registered Participants and financially responsible participants the substituted metering data within 2 business days of the receipt of any fault reason codes associated with a reading failure or failed interrogation event, into the metering data services database;

(4) validate and deliver to NTESMO, Registered Participants and financially responsible participants all substituted metering data within 2 business days of the metering data being substituted;

(5) ensure that all metering data is delivered to NTESMO, Registered Participants and financially responsible participants for the full period of any retrospectively created metering data streams within 2 business days of that metering data streams being created; and

(6) for type 4A, 5, 6 and 7 metering installations, validate and deliver to NTESMO, Registered Participants and financially responsible participants all estimated metering data within 2 business days of the metering data being estimated.

(e) Each Metering Data Provider must provide metering data to the relevant financially responsible participants within 2 business days of receiving a completed notification of a change of financially responsible participants, including estimated metering data, for a type 4A, 5, 6 or 7 metering installation.

Review of failed validations

(f) Each Metering Data Provider must ensure that all failed validations are reviewed promptly so as to:

(1) where the initial review of the failed validation identifies that the actual meter readings are valid, deliver the actual meter readings to NTESMO, Registered Participants and financially responsible participants within 2 business days of the metering data being received into the metering data services database; and

(2) where further information is required to validate the actual meter readings, and the receipt of such information identifies that the actual meter readings are valid, deliver the actual meter readings to NTESMO, Registered Participants and financially responsible participants within 2 business days of the metering data passing validation.

Operational delays

(g) The Metering Data Provider must notify NTESMO and affected Registered Participants immediately upon the identification of any operational delays impacting on normal metering data delivery.
S7A.8.10 Data management following the alteration of type of metering installation at a connection point

**S7A.8.10.1 Meter churn scenarios**

(a) Meter churn can result in a change to the configuration of metering data recorded by a metering installation. This change in metering data may result in an alteration to the Metering Data File Format file.

(b) Where a meter churn takes place, each Metering Data Provider must:

1. comply with the Metering Data File Format requirements when constructing the Metering Data File Format file associated with the change in type of metering installation; and

2. for a meter churn scenario described in an item of column 1 of the following table, comply with the requirements for the management of metering data described in the provision listed in column 2 of that item of the following table:

<table>
<thead>
<tr>
<th>Column 1 Meter churn scenario</th>
<th>Column 2 Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>A metering installation is changed from a type 6 metering installation to a new type 6 metering installation (Scenario 1)</td>
<td>Clause S7A.8.10.2</td>
</tr>
<tr>
<td>A metering installation is changed from a type 6 metering installation to a type 1, 2, 3, 4, 4A, or 5 metering installation (Scenario 2)</td>
<td>Clause S7A.8.10.3</td>
</tr>
<tr>
<td>A metering installation is changed from a type 1, 2, 3, 4, 4A, or 5 metering installation to a type 6 metering installation (Scenario 3)</td>
<td>Clause S7A.8.10.4</td>
</tr>
<tr>
<td>A metering installation is changed from a type 1, 2, 3, 4, 4A, or 5 metering installation to a new type 1, 2, 3, 4, 4A, or 5 metering installation (Scenario 4)</td>
<td>Clause S7A.8.10.5</td>
</tr>
</tbody>
</table>
S7A.8.10.2 Scenario 1

The Metering Data Provider must have a process to ensure that:

(a) the final accumulation meter reading(s) from the removed type 6 metering installation are applied at the end of the day prior to the meter churn;

(b) the start reading(s) for a new type 6 metering installation are applied at the start of the day of the meter churn; and

(c) estimated metering data is provided for any metering data streams made active as a result of the meter churn.

S7A.8.10.3 Scenario 2

(a) The Metering Data Provider must have a process to ensure that:

(1) the final accumulation meter reading(s) from the removed type 6 metering installation are applied at the end of the day prior to the meter churn;

(2) the metering data for the new type 1, 2, 3, 4, 4A, or 5 metering installation commences at the start of the day of the meter churn; and

(3) estimated metering data is provided for any metering data streams made active as a result of the meter churn for a new type 4A or type 5 metering installation.

(b) The Metering Data Provider must have a process to ensure that the metering data for the period of the meter churn day between the start of the day and the commissioning of the new metering installation is provided as zeroes with a quality flag of F.

S7A.8.10.4 Scenario 3

Where reversion from a type 1, 2, 3, 4, 4A, or 5 metering installation to a type 6 metering installation is permitted, the Metering Data Provider must have a process to ensure that:

(a) the final reading(s) from the removed type 1, 2, 3, 4, 4A, or 5 metering installation cease at the end of the day of the meter churn;

(b) the metering data for the period of the meter churn day between commissioning of the new metering installation and the end of the day of the meter churn is provided as zeroes with a quality flag of F; and

(c) the start reading(s) for the new type 6 metering installation are applied at the start of the day following the day of the meter churn.

S7A.8.10.5 Scenario 4

Each Metering Data Provider must have a process to ensure compliance with the following requirements:

(a) the final reading(s) from the removed type 1, 2, 3, 4, 4A, or 5 metering installation is collected up to the removal of the old metering installation on the day of the meter churn;

(b) the metering data for the new type 1, 2, 3, 4, 4A, or 5 metering installation commences at the start of the day of the meter churn;
(c) the Metering Data Provider related to the new metering installation must obtain metering data for the period of the meter churn day between the start of the meter churn day and the removal of the old metering installation from the Metering Data Provider related to the old metering installation;

(d) the Metering Data Provider related to the new metering installation must combine the metering data from the old metering installation and the new metering installation for the day of meter churn and deliver metering data for the whole day of meter churn;

(e) where meter churn results in a change to the recording of metering data from 15-minute to 30-minute intervals, the 15-minute intervals of metering data from the start of the meter churn day until the commissioning of the new metering installation are to be aggregated to form interval metering data;

(f) where meter churn results in a change to the recording of metering data from 30-minute to 15-minute intervals:
   (1) the 15-minute intervals of metering data from the commissioning of the new metering installation to the end of the meter churn day are to be aggregated to form 30-minute interval metering data; or
   (2) the 30-minute intervals of metering data for the start of the meter churn day may be disaggregated to form 15-minute interval metering data, where agreed with the Metering Coordinator;

(g) estimated metering data is provided for any metering data streams made active as a result of the meter churn for a new type 4A or type 5 metering installation;

(h) where meter churn results in a metering data stream being made active, the Metering Data Provider related to the new metering installation must provide metering data from the start of the day to the commissioning of the new metering installation by providing zeroes with a quality flag of F;

(i) where meter churn results in a metering data stream being made inactive, the Metering Data Provider must provide metering data from the commissioning of the new metering installation to the end of the day by providing zeroes with a quality flag of F; and

(j) the Metering Data Provider must create final substituted metering data for the period between the existing metering installation being removed and the commissioning of the new metering installation.

S7A.8.11 System architecture and administration

S7A.8.11.1 Metering data archival and recovery

Each Metering Data Provider must have retrieval mechanisms (both electronic and archived) that allow the metering data retained in its metering data services database under clause 7A.8.3 to be accessed, recovered, re-evaluated and delivered in agreed timeframes to NTESMO, Registered Participants or financially responsible participants.
S7A.8.11.2 Data backup

All metering data and metering register information must be backed-up, at a minimum, on a daily basis and held in a secure environment.

S7A.8.11.3 Disaster recovery

Requirement for disaster recovery plan

(a) Each Metering Data Provider must ensure that a disaster recovery plan is established and in place to ensure that in the event of a system failure, its IT systems can be returned to normal operational service within 2 business days.

(b) The Metering Data Provider must ensure that the disaster recovery plan is:

(1) up to date with all documentation showing revisions; and

(2) witnessed and dated at least annually by the Metering Data Provider as being current for the systems and processes in place.

Fall-over system approach

(c) Where a Metering Data Provider adopts a disaster recovery plan that has a complete ‘fail-over’ system approach, the disaster recovery plan must be subjected to a test annually that facilitates a full ‘fail-over’ to the recovery system.

Segmented system approach

(d) Where the Metering Data Provider adopts a disaster recovery plan that has a segmented system approach, the disaster recovery plan must:

(1) detail the interfaces and relationships between system segments;

(2) be established for each individual system segment;

(3) be tested annually with evidence retained to show disaster recovery for each individual system segment; and

(4) have, for each individual system segment, a procedure that clearly details the process to establish a return to full operation.

Testing

(e) Expected evidence to support disaster recovery plan testing should include, but not be limited to:

(1) a test plan of the fail-over;

(2) results of the fail-over including timing;

(3) system logs indicating fail-over and recovery; and

(4) logs or notations evidencing resumption of Metering Data Provider operations.

Actions following system failure

(f) If a system failure occurs, the Metering Data Provider must ensure that within 2 business days:
(1) its metering data services database is restored to operational service; and

(2) all processing and delivery backlogs of metering data to NTESMO and Registered Participants is completed.

Notice to NTESMO of activation of disaster recovery plan

(g) The Metering Data Provider must, at its earliest opportunity, notify NTESMO of any failure where the Metering Data Provider has a requirement to activate its disaster recovery plan.

S7A.8.11.4 System administration and data management

Metering data services database

(a) The metering data services database must be operated and administered by a Metering Data Provider to facilitate:

(1) controlled access to systems and data using unique identification and passwords for each user;

(2) the restriction of access to the underlying database tables to nominated system administrators;

(3) the restriction of Registered Participant access to metering data and NT NMI data in accordance with paragraph 7A.13.5(c);

(4) a minimum of 95% system availability (that is, hardware and systems downtime do not exceed a maximum of 438 hours per annum).

Metering register

(b) Each Metering Data Provider must maintain full audit trails and version control of metering register information, metering data for at least 7 years so that any data output produced by the system can be re-produced from source data.

S7A.8.12 Quality control

S7A.8.12.1 Audits

(a) Audits may be undertaken at any time by the Utilities Commission in accordance with the Rules and may be carried out following a request from a Registered Participant.

(b) Where an audit of a metering installation is conducted by the Utilities Commission under clause 7A.7.4, and metering data must be obtained from the Metering Data Provider in support of this audit, the Metering Data Provider must provide the metering data within 2 business days of the Utilities Commission's request.

(c) Each Metering Data Provider must assist the Utilities Commission with reasonable requests for the provisioning of metering data and relevant information relating to connection points that are part of the audit process of Metering Coordinators, Metering Providers and Metering Data Providers.
S7A.8.12.2 Corrective action

(a) Each Metering Data Provider must take corrective action on any reported instances of non-compliance identified by NTESMO or through a Metering Data Provider audit process.

(b) Where a Metering Data Provider becomes aware that incorrect metering data has been delivered to NTESMO and Registered Participants, the Metering Data Provider must provide corrected metering data to all affected parties within 1 business day as required by paragraph 7A.8.3(d).

(c) NTESMO may request corrective action where errors or omissions are found within the settlements process and such requests are to be actioned as a priority by the Metering Data Provider.

(d) Where the Metering Data Provider cannot deliver the corrected metering data in the timeframe specified above, the Metering Data Provider must advise NTESMO and agree on an alternative delivery time.

S7A.8.13.1 Administration

Provision of data

(a) A Registered Participant may request a Metering Data Provider to:

(1) provide metering data in an alternative format, method or timeframe;

(2) provide any other metering data services; or

(3) any combination of the above.

No data to be provided

(b) A Registered Participant may request a Metering Data Provider to not provide or deliver any metering data to the Registered Participant as required under this Part.

System changes not required

(c) There is no requirement for a Metering Data Provider to implement system changes and processes to facilitate bilateral agreements.

Bilateral agreement not to impact metering data delivery to NTESMO

(d) Any acceptance by a Metering Data Provider to deliver metering data to a Registered Participant in accordance with any agreement contemplated by this clause S7A.8.13.1 or acceptance to not provide any metering data in accordance with such an agreement must not impact on metering data delivery to NTESMO or any other Registered Participant for the connection point(s) concerned.

Bilateral agreement to be auditable

(e) Any bilateral agreement established between a Registered Participant and a Metering Data Provider must be in writing and made available to the Utilities Commission on request for audit purposes.
S7A.8.13.2 Quality systems

Each Metering Data Provider must operate and retain a quality system that is at least equal to a quality accreditation to the ISO9001 or ISO9002 standards.