New South Wales Electricity Supply Industry
Metrology Procedure

Types 5, 6 and 7 Metering Installations

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

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1. General

1.1 Interpretation

1.1.1 In this *Metrology Procedure*, the words and phrases defined in Attachment 1 have the meanings given to them in that Attachment, unless an intention to the contrary appears.

1.1.2 This *Metrology Procedure* must be interpreted in accordance with the rules of interpretation set out in Attachment 2, unless an intention to the contrary appears.

1.2 Purpose

1.2.1 The purpose of this *Metrology Procedure* is to set out:

(a) a summary of the obligations of the *Responsible Person,* in relation to type 5, 6 and 7 *metering installations* for *second tier loads,* that are contained in the *Code,* for ease of reference;

(b) the additional obligations of the *Responsible Person* in relation to the provision, installation and maintenance of type 5, 6 and 7 *metering installations* for *second tier loads*, including the measurement of electrical *energy* and the provision of data to facilitate the efficient operation of the *market*; and

(c) the obligations of *NEMMCO* in relation to the conversion of *consumption energy data* into *trading interval data* to facilitate the efficient operation of the *market*.

1.2.2 In particular, this *Metrology Procedure* sets out provisions for type 5, 6 and 7 *metering installations* relating to:

(a) the type of *metering installation* permitted for the measurement of *active energy*;

(b) the collection or calculation, and processing, of *energy data*;

(c) the provision, installation and maintenance of *metering installations*;

(d) the components of each type of *metering installation*;

(e) storage of, and rights of access to, *energy data* in the *metering installation*; and

(f) testing and auditing of *metering installations.*

1.2.3 Although the *Responsible Person* is responsible for provision, installation and maintenance of *metering installations*, the *Responsible Person* must engage *Metering Provider(s)* to undertake these tasks, unless:

(a) the *Responsible Person* is a *Local Network Service Provider* and a *Metering Provider*; or

(b) another person elects to engage a *Metering Provider* for the purposes of installing the *meter* and/or *data logger* (that is, to engage a *Metering Provider* under the NSW Accredited Service Provider scheme).

1.2.4 *Metering Providers* must be registered with *NEMMCO* on the basis of the capabilities required for type 5, 6 and 7 *metering installation* as specified in Schedules 14, 15 and 16, respectively.

1.2.5 For the period (if any) during which the *Local Network Service Providers* are, pursuant to Chapter 9 of the *Code*, the exclusive *Responsible Persons* for types 5, 6 and 7 *metering installations* installed at a *connection point* consuming less than 100MWh per annum, the *Responsible Person* for the *parent* of an *embedded network* must be the *Responsible Person* for a *child* in that *embedded network* with a type 5, 6 or 7 *metering installation* installed at a *connection point* consuming less than 100MWh.

1.3 For the purposes of this *Metrology Procedure*, Application

1.3.1 The effective date for this *Metrology Procedure* in respect of a type of *metering installation*, is the later of:

(a) three (3) months after the date of publication by *NEMMCO*; and

(b) the date determined by the *Metrology Coordinator* and notified to each *Local Network Service Provider* and each *Retailer* in writing as the date on which all the required systems and processes for that type of *metering installation* are operational.

1.3.2 This *Metrology Procedure* applies only to type 5, 6 and 7 *metering installations* that are *connected* to the *distribution network* owned or operated by *Local Network Service Providers* licensed in New South Wales, or unlicensed *distribution networks* in New South Wales.

1.3.3 If a provision of this *Metrology Procedure* is inconsistent with the *National Electricity Code*, the *National Electricity Code* prevails to the extent of the inconsistency.

1.3.4 If a provision of this *Metrology Procedure* is inconsistent with the *Electricity Safety Act 1995*, the *Electricity Safety Act* prevails to the extent of the inconsistency.

1.3.5 The *Metrology Coordinator* may issue guidelines and procedures that clarify aspects of this *Metrology Procedure*.

2. Meter Provision

2.1 Metering Installation Components – Meter Provision

2.1.1 The requirements in this clause 2 are applicable to type 5 and type 6 *metering installations* only.

2.1.2 The *Responsible Person* must ensure that the components, characteristics and requirements for *meter provision* for type 5 and type 6 *metering installations* are as shown in Schedules 1 and 2, respectively. Schedules 1 and 2 detail the minimum requirements for *meter provision* for the type 5 and type 6 *metering installations*.

2.1.3 The *Responsible Person* must allow another person to engage a registered *Metering Provider* for the purposes of installing the *meter* and/or *data logger* in accordance with the *National*

Electricity Code, that is, to engage a registered *Metering Provider* under the NSW Accredited Service Provider scheme.

2.1.4 Where the *Responsible Person* has engaged *Metering Provider(s)* in accordance with clause ~~1.2.3,~~1.2.3, the *Responsible Person* must advise the *Metering Provider(s)* of the components, characteristics and requirements that are to be used for the *metering installation* (as outlined in Schedules 1 and 2 of this *Metrology Procedure*).

2.1.5 The *Responsible Person* must ensure that, where another person engages a registered *Metering Provider* for the purposes of installing the *meter* and/or *data logger*, a *meter* and/or *data logger* is provided to that *Metering Provider* by the *Metering Provider* engaged for the purposes of providing the *meter* and/or *data logger*.

2.1.6 The *Responsible Person* must ensure that the *Metering Provider(s)* install and/or maintain the type 5 or type 6 *metering installation* in accordance with the components, characteristics and requirements nominated by the *Responsible Person*.

2.1.7 *Metering installations* which have been installed, or which are held in stock for the *Responsible Person*, prior to the effective date of the initial *Metrology Procedure* and which do not meet the requirements in Schedule 1 or 2, may be used where approved by the *Metrology Coordinator*. The *Metrology Coordinator* shall issue guidelines on the approval process.

Note: where the *metering installation* includes equipment for time switching or *load* control, or the measurement of *reactive energy*, the installation and operation of that equipment will be governed by an instrument other than this *Metrology* Procedure, for example, an agreement between the *Local Network Service Provider* and the *Financially Responsible Market Participant*.

2.2 Metering Installations of a Parent and Child

~~(a)~~2.2.1 Should a *child* ~~elect to transfer to a *second tier*~~in an *embedded network* elect to purchase electricity from a *Retailer* other than the *parent's Retailer*, the *Responsible Person* must ensure that, at the time the *child* switches *Retailer* and at the cost of the *child*:

~~1.~~if the *parent* has an *interval meter*~~installed~~ that is settled on the basis of *interval energy data*, the *child* ~~has~~must have a type 4 or type 5 *metering*~~*installation;*~~

~~(b)~~(a) ~~if the *parent* has an *interval meter* installed~~*installation* that is settled on the basis of ~~accumulation data, the *child* has a type 6 *metering installation; or*~~*interval energy data;*

~~(c)~~(b) if the *parent* has an *accumulation meter* ~~installed~~or an *interval meter* that is settled on the basis of *accumulated energy data,* the *child* ~~has~~must have a type 6 *metering installation* or, if the *child* has an *interval meter*, that *meter* must be settled on the basis of *accumulated energy data.*

2.2.2 Where a child in an embedded network has switched Retailer in accordance with clause 2.2.1(b) and the parent subsequently:

(a) installs an interval meter and elects to have its meter settled on the basis of interval energy data or

(b) elects to have its existing interval meter settled on the basis of accumulated energy data in accordance with clause 2.3.4; or

(c) elects to have its existing interval meter settled on the basis of interval energy data,

~~2.2.2Should a *parent* elect to transfer to a *second tier Retailer*,~~ the Responsible Person must ensure that ~~all *children*, who have not previously elected to transfer to a *second tier Retailer*, also transfer to the same *second tier Retailer* as the *parent*.~~at the time the parent changes, and at the cost of the parent, the child's metering installation meets the requirements of paragraph (a) or (b) of clause 2.2.1, as applicable.

2.3 Reversion of Metering Installation Types

2.3.1 The *Responsible Person* must ensure that a *meter*, which meets the requirements of a type 5 *metering installation*, and is installed at a *connection point* consuming more than 100 MWh per annum and less than 160 MWh per annum, is not removed from a *metering point*, unless:

(a) the *metering installation* is to be replaced by a *metering installation* type 1, 2, 3, 4, or 5; or

(b) the *NMI* is deregistered.

2.3.2 ~~Where~~Subject to clause 2.3.7, where an interval meter is installed at a connection point consuming less than 100 MWh per annum, the interval meter may initially be read as either a metering installation type 5 or a metering installation type 6.

2.3.3 ~~Where~~Subject to clause 2.3.7, where an interval meter has been installed in accordance with clause ~~2.3.2,~~2.3.2, the reading of that interval meter may be changed from being read as a metering installation type 6 to being read as a metering installation type 5, at any time.

2.3.4 Where an *interval meter* has been installed in accordance with clause ~~2.3.2,~~2.3.2, the *Responsible Person* must ensure that the reading of that *interval meter* may only be changed from being read as a *metering installation* type 5 to being read as a *metering installation* type 6 when:

(a) a transfer of the end-use customer to a new *Retailer* has been effected, or

(b) the *interval meter* has been read as a *metering installation* type 5 for a period of at least 12 contiguous months with the existing *Retailer*.

2.3.5 Where an *interval meter* has been installed in accordance with clause ~~2.3.2,~~2.3.2, the *Responsible Person* must ensure that it is not replaced with an *accumulation meter*.

2.3.6 The *Responsible Person* must ensure that a *meter*, which is a sample *interval meter* installed for the purposes of calculating ~~the~~a *Controlled Load Profile*, is not removed without the consent of the *Local Network Service Provider*.

2.3.7 The Responsible Person must ensure that the energy consumed and measured by a meter, which is a sample interval meter installed for the purposes of calculating a Controlled Load Profile, is settled in the wholesale electricity market on the basis of a metering installation type 6.

2.4 Testing and Inspection of Meters

2.4.1 The *Responsible Person* must ensure that type 5 and 6 *metering installations* are tested and inspected in accordance with Schedules 1 and 2, respectively.

2.4.2 ~~Subject to clause 2.4.3, clauses 2.4.4 to 2.4.11~~Clauses 2.4.3 to 2.4.11 (inclusive) are to be regarded as the asset management strategy guidelines for the whole-current (direct connected) meters for the purposes of ~~Schedule~~schedule 7.3 of the Code.

2.4.3 When the Australian Standard "AS1284 Part ~~13: In-service~~ 13: In--service compliance testing" has been published,~~that standard supersedes clauses 2.4.4 to 2.4.11 (inclusive) and is to be regarded as~~ the asset management ~~strategy guidelines for whole-current (direct connected) *meters* for the purposes of Schedule 7.3 of the *Code*.~~plan referred to in clause 2.4.4 must include, as a minimum, the requirements of that standard.

2.4.4 The *Responsible Person* must ensure that an asset management plan is established and maintained for the testing and inspection requirements of whole-current (direct connected) *meters*.

2.4.5 Where the *Responsible Person* is not the *Local Network Service Provider*, the *Responsible Person* must provide reasonable access to the asset management plan for the *Local Network Service Provider*.

2.4.6 For the purposes of the asset management plan, the whole-current (direct connected) *meters* must be divided into classes.

2.4.7 Where historical *meter* records permit, the classes referred to in clause ~~2.4.6~~2.4.6 should consist of *meters* of the same year of manufacture and common design.

2.4.8 The *Responsible Person* must ensure that a *sampling plan* is established and maintained in accordance with the asset management plan to ensure that each class of whole-current (direct connected) *meter*, and associated *data logger* (where the *data logger* is located at the *metering point*) for type 5 *metering installations*, is tested at least once in the first fifteen (15) years following manufacture and at least once in each subsequent five (5) year period.

2.4.9 For those whole-current (direct connected) *meters* for which new or amended pattern approval has been received from the National Standards Commission, or for which new or amended type testing has been undertaken by a *NATA* accredited laboratory or overseas equivalent, the *Responsible Person* must ensure that the *sampling plan* ensures that this class of *meter* is tested at least once in the first three (3) years following receipt of the new or amended pattern approval, or the new or amended type test certificate.

2.4.10 If the results from a sampling test carried out in accordance with a *sampling plan* described in clauses ~~2.4.8 and 2.4.9~~2.4.8 and 2.4.9 demonstrate that more than 30% of the class of *meters* has errors greater than 2%, then the *Responsible Person* must ensure that all *meters* in that class are replaced or recalibrated within a reasonable period of time.

2.4.11 The asset management plan must include, but not be limited to:

(a) Records relating to *meter* classes and age of manufacture;

(b) *Meter* test records for each *meter* class;

(c) *Meter* test plan for each *meter* class based on *meter* quantity (sample size) and *meter* age;

(d) Frequency of test;

(e) Records of *meter* failures per *meter* class;

(f) Planned replacement strategy based on age and/or performance;

(g) Location of each *meter*; and

(h) *Meter* registration number.

2.5 Installation of Meter

Where the *Responsible Person* has engaged the *Metering Provider* for the installation of the *meter* and/or *data logger*, it must ensure that when each *meter* and associated *data logger* (where the *data logger* is located at the *metering point*) of a type 5 *metering installation* or *meter* of a type 6 *metering installation* is installed, it is checked to ensure that it:

(a) Complies with the relevant requirements of Schedules 1 or 2, respectively subject to clause ~~2.1.7;~~2.1.7;

(b) Has been tested and inspected prior to installation in accordance with the relevant requirements of Schedules 1 and 2, respectively; and

(c) has the optical port, communications port, and/or visual display located so that the optical port, communications port, and/or visual display can be readily accessed for *meter* reading.

3. Metering Data Services

3.1 Metering Installation Components – Metering Data Services

3.1.1 The *Responsible Person* must ensure that the components, characteristics and requirements for *metering data services* for type 5, type 6 and type 7 *metering installations* are as shown in Schedules 3, 4 and 5, respectively. Schedules 3, 4 and 5 detail the minimum requirements for *metering data services* for type 5, type 6 and type 7 *metering installations*.

3.1.2 Where the *Responsible Person* has engaged *Metering Provider(s)* in accordance with clause ~~1.2.3,~~1.2.3, the *Responsible Person* must advise the *Metering Provider(s)* of the components, characteristics and requirements that are to be used for the *metering installation* (as outlined in Schedules 3, 4 and 5 of this *Metrology Procedure)*.

3.1.3 The *Responsible Person* must ensure that *Metering Provider(s)* install and/or maintain a *metering installation* in accordance with the components, characteristics and requirements nominated by the *Responsible Person*.

3.2 Meter Reading

3.2.1 For type 5 *metering installations* (excluding type 5 *metering installations* that are sample *meters* for the purposes of developing the *Controlled Load Profile(s)* in accordance with Schedule 10 clause 2), the *Responsible Person* must:

(a) ensure that *interval energy data* is collected from the *meters*/associated *data loggers* representing at least 99.8% of *estimated* total consumption, based on the previous 12 month period, for type 5 *metering installations* for which that *Responsible Person* is responsible, and this data is transferred to the *metering installation database* of a type 5 *metering installation*, at a frequency which is at least once every twenty-eight (28) weeks;

(b) ensure that interval energy data is collected from the meters/associated data loggers representing at least 90% of estimated total consumption, based on the previous 12 month period, for type 5 metering installations for which that Responsible Person is responsible, and this data is transferred to the metering installation database of a type 5 metering installation, at a frequency which is at least once every ~~*lock down period;*~~fourteen (14) weeks; and

(c) use *reasonable endeavours* to ensure that *interval energy data* is collected from the *meters*/associated *data loggers* and this data is transferred to the *metering installation database* of a type 5 *metering installation* at a frequency which is at least once every three (3) months.

3.2.2 For type 5 *metering installations* that are sample *meters* for the purpose of developing the *Controlled Load Profile(s)* in accordance with Schedule 10 clause 2, the *Responsible Person* must ensure that *interval energy data* is collected from the *meters*/associated *data loggers* and this data is transferred to the *metering installation database* of a type 5 *metering installation*, at a frequency which is at least once per week.

3.2.3 For type 6 *metering installations*, the *Responsible Person* must:

(a) ensure that *accumulated energy data* is collected from *meters* representing at least 99.8% of *estimated* total consumption, based on the previous 12 month period, for type 6 *metering installations* for which that *Responsible Person* is responsible and this data is transferred to the *metering installation database* of a type 6 *metering installation* at a frequency which is at least once every twenty-eight (28) weeks;

(b) for controlled loads, ensure that accumulated energy data is collected from meters representing at least 90% of estimated total consumption, based on the previous 12 month period and controlled load type 6 metering installations for which that Responsible Person is responsible, and this data is transferred to the metering installation database of a type 6 metering installation, at a frequency which is at least once every ~~*lock down period;*~~fourteen (14) weeks; and

(c) use *reasonable endeavours* to ensure that *accumulated energy data* is collected from the *meters* and this data is transferred to the *metering installation database* of a type 6 *metering installation* at a frequency which is at least once every three (3) months.

3.2.4 For the purposes of clauses ~~3.2.1, 3.2.2 and 3.2.3~~3.2.1, 3.2.2 and 3.2.3 the frequency of *meter* reading for a *metering installation* commences from the most recent *meter* reading prior to, or in conjunction with, the end-use customer transferring to a new *Retailer*.

3.2.5 For the purposes of clauses ~~3.2.1 and 3.2.3,~~3.2.1 and 3.2.3, data collected includes data that has been substituted in accordance with clause 3.3.2.

3.2.6 The *Responsible Person* must use *reasonable endeavours* to ensure that *energy data* is collected from a *meter*/associated *data logger* and this data is transferred to the relevant *metering installation database*, no more than two (2) *business days* prior to, or two (2) *business days* subsequent to, the *scheduled reading date* for that *metering installation*.

3.2.7 The *Responsible Person* must ensure that a schedule is developed and maintained to determine the *scheduled reading dates* for each *metering installation* in accordance with clauses ~~3.2.1~~3.2.1 and 3.2.3, and the *meter* reading frequency as agreed between the *Financially Responsible Market Participant* and the *Local Network Service Provider*.

3.2.8 The *Financially Responsible Market Participant* may request that the *Responsible Person* arrange for a *special meter read* after a *meter* has been first installed or when an end-use customer first transfers to the *Financially Responsible Market Participant*, if *energy data* cannot be obtained in the time frames required for the *NEMMCO settlements timetable* (refer clause 3.15 of the *Code*) and appropriate data is not available on which to base an *estimate* in accordance with clause ~~3.4.1.~~3.4.1.

3.2.9 The *Responsible Person* must in all other respects arrange for any *special meter reads*, *final meter reads* or *estimated reads* to be undertaken in accordance with any relevant transfer rules or jurisdictional instruments which relate to *meter* reading.

Note: For the purposes of clauses ~~3.2.1 and 3.2.3,~~3.2.1 and 3.2.3, depending on the profile of *metering installations* for which that *Responsible Person* is responsible, 99.8% of *estimated* total consumption may equate to, for example, 99.95% of data collected from *metering installations* at which greater than 40 MWh per annum is consumed, 99.9% of data collected from *metering installations* at which between 10 and 40 MWh per annum is consumed, and 99.5% of data collected from *metering installations* at which less than 10 MWh per annum is consumed. 90% of *estimated* total consumption may equate to, for example, 99% of data collected from *metering installations* at which greater than 40 MWh per annum is consumed, 95% of data collected from *metering installations* at which between 10 and 40 MWh per annum is consumed, and 85% of data collected from *metering installations* at which less than 10 MWh per annum is consumed.

3.3 Validation and Substitution of Energy Data

3.3.1 The *Responsible Person* must ensure that *energy data* collected for a type 5 or type 6 *metering installation* in accordance with clause ~~3.2,~~3.2, is validated in accordance with the validation rules in Schedule 6 clause 1 or Schedule 8 clause 1, respectively.

3.3.2 The *Responsible Person* must ensure that the *energy data* is *substituted* where:

(a) The *energy data* collected for a type 5 *metering installation* fails the validation test conducted in accordance with clause ~~3.3.1,~~3.3.1, in which case the *interval energy data* is *substituted* in accordance with Schedule 6 clause 3;

(b) The *energy data* collected for a type 6 *metering installation* fails the validation test conducted in accordance with clause ~~3.3.1,~~3..3.1, in which case the *consumption energy data* is *substituted* in accordance with Schedule 8 clause 3;

(c) There has been a failure of the metering equipment, in which case the *energy data* for a type 5 or type 6 *metering installation* is *substituted* in accordance with Schedule 6 clause 3 or Schedule 8 clause 3, respectively;

(d) An inspection or test on the metering equipment has established that a measurement error exists, in which case the *energy data* for a type 5 or type 6 *metering installation* is *substituted* in accordance with Schedule 6 clause 3 or Schedule 8 clause 3, respectively; or

(e) An *estimated read* is permitted in accordance with clause ~~3.2.9~~3.2.9 and is required to transfer a customer to a new *Retailer*, in which case the *energy data* for a type 6 *metering installation* is *substituted* in accordance with Schedule 8 clause 3.

3.3.3 The *Responsible Person* must ensure that, where the *energy data* is *substituted* in accordance with clause ~~3.3.2,~~3.3.2, affected *Code Participants* are advised that *substituted* data will be used for wholesale settlement purposes via the status flag in the data file format.

3.4 Estimation of Energy Data

3.4.1 Subject to clause ~~3.4.3,~~3.4.3, the *Responsible Person* must ensure that the *interval energy data* for a type 5 *metering installation* or *consumption energy data* for a type 6 *metering installation* is *estimated* in accordance with Schedule 7 or 9 respectively, where the *energy data* cannot be obtained in the time frames required for the *NEMMCO settlements timetable* (refer clause 3.15 of the *Code*).

3.4.2 The *Responsible Person* must ensure that where *energy data* is subsequently collected for a *metering installation* within the time frames required for the *NEMMCO settlements timetable* (refer clause 3.15 of the *Code*) then, subject to clause ~~3.3,~~3.3, the *estimated energy data* is replaced with the *actual meter reading*.

3.4.3 The *Responsible Person* may elect, where *energy data* is required to be *estimated* in accordance with clause ~~3.4.1,~~3.4.1, that the *energy data* is *estimated* by *NEMMCO* in accordance with clause ~~3.10.4,~~3.10.4, if agreed by the *Local Network Service Provider*, *Financially Responsible Market Participant*, *Local Retailer* and *NEMMCO*.

3.4.4 The *Responsible Person* must ensure that where *energy data* is *estimated* in accordance with clause ~~3.4.1,~~3.4.1, affected *Code Participants* are advised that *estimated* data will be used for wholesale settlement purposes via the status flag in the data file format.

3.5 Calculation of Energy Data for Type 7 Metering Installation

3.5.1 The *Responsible Person* must ensure that *energy data* for a type 7 *metering installation* is calculated in accordance with Schedule 11, at a frequency which is consistent with the *NEMMCO settlements timetable* (refer clause 3.15 of the *Code*).

3.5.2 The *Responsible Person* must ensure that the *energy data* for a type 7 *metering installation*, which is calculated in accordance with clause ~~3.5.1,~~3.5.1, is validated in accordance with Schedule 12 clause 1.

3.5.3 The *Responsible Person* must ensure that the *energy data* is *substituted* in accordance with Schedule 12 clause 3 where the *energy data* calculated for a type 7 *metering installation* fails the validation test conducted in accordance with clause ~~3.5.2.~~3.5.2.

3.5.4 The *Responsible Person* must ensure that where *energy data* for a type 7 *metering installation* is *substituted* in accordance with clause ~~3.5.3,~~3.5.3, affected *Code Participants* are advised that *substituted* data will be used for wholesale settlement purposes via the status flag in the data file format.

3.6 Data Storage

3.6.1 The *Responsible Person* must provide a *metering installation database* containing *energy data* in respect of each type 5, 6 and 7 *metering installation*, in accordance with the requirements in Schedules 3, 4 or 5, respectively.

3.6.2 For the avoidance of doubt, the *energy data* for a type 5 or type 6 *metering installation* is the data collected from the *meter*/associated *data logger* in accordance with clause ~~3.2,~~3.2, subject to clause ~~3.3,~~3.3, and/or the data that is *estimated* in accordance with clause ~~3.4.~~3.4.

3.6.3 The rights of access to the data held within the *metering installation database* are set out in clause 7.7 of the *Code* and in clause ~~3.7~~3.7 of this *Metrology Procedure*.

3.7 Information

3.7.1 Where the Responsible Person is not the Financially Responsible Market Participant, the Responsible Person must ensure that access is provided for a Financially Responsible Market Participant to energy data in the metering installation database ~~in relation to~~for each metering installation~~for~~ which is installed in relation to a connection point that relates to the Financially Responsible Market ~~*Participant* has registered with *NEMMCO.*~~Participant's NEMMCO account statements.

3.7.2 Where the *Responsible Person* is not the *Local Network Service Provider*, the *Responsible Person* must ensure that access is provided for the *Local Network Service Provider* to *energy data* in the *metering installation database* in relation to each *metering installation* which is installed in relation to a *metering point* on that *Local Network Service Provider's distribution network*.

3.7.3 The *Responsible Person* must ensure that access is provided for the *Local Retailer* to *energy data* in the *metering installation database* for each *metering installation* which is installed in relation to a *connection point* that relates to the *Local Retailer's NEMMCO* account statements.

3.7.4 For the purposes of clauses ~~3.7.1 to 3.7.3,~~3.7.1 to 3.7.3, access to *energy data* must be provided as follows:

(a) where *energy data* for a type 5 or type 6 *metering installation* has been collected in accordance with clause ~~3.2,~~3.2, and validated and *substituted* in accordance with clause ~~3.3,~~3.3, by 5.00pm on the second *business day* after that *energy data* has been collected;

(b) where *energy data* for a type 5 or type 6 *metering installation* has been *estimated* in accordance with clause ~~3.4,~~3.4, by 5.00pm on the second *business day* after that *energy data* has been *estimated*; or

(c) where *energy data* for a type 7 *metering installation* has been calculated, validated and *substituted* in accordance with clause ~~3.5,~~3.5, by 5.00pm on the second *business day* after that *energy data* has been calculated.

3.8 Validation of Metering Installation Database

3.8.1 The *Responsible Person* must ensure that a *sampling plan* is established and maintained, in accordance with *Australian Standards* "AS1199: Sampling Procedures and Tables for Inspection by Attributes" or "AS2490: Sampling Procedures and Charts for Inspection by Variables for Percent Nonconforming" to validate that the data stored in the *metering installation database* with respect to a type 5 or type 6 *metering installation* has been downloaded correctly from the *meter* or *meter*/associated *data logger*.

3.8.2 The validation test must be conducted at a frequency in accordance with the *sampling plan* described in clause ~~3.8.1,~~3.8.1, which must not be less than once every twelve (12) months.

3.8.3 If there is an inconsistency between the data held in a *meter* or *meter*/associated *data logger*, and the data held in the *metering installation database*, the data in the *meter* or *meter*/associated *data logger* is to be taken as prima facie evidence of the *energy data* for that *metering point*.

3.8.4 The *Responsible Person* must ensure that a *sampling plan* is established and maintained in accordance with Schedule 13 to validate that the data stored in the *metering installation database* with respect to a type 7 *metering installation* is consistent with the *physical inventory*.

3.8.5 A validation test must be conducted at a frequency in accordance with the *sampling plan* described in clause ~~3.8.4,~~3.8.4, which must not be less than once every twelve (12) months.

3.8.6 The *energy data* stored in a *metering installation database* for a type 7 *metering installation*, for a *NMI*, is consistent with the *physical inventory* if the error associated with calculating the *energy* value for the sample, that is,

$$\frac{\sum_{i=1}^{n} \left(\text{Agreed } \textit{load} \text{ per device type as per Load Table}\right)_i * \left(\text{Actual number of device type in the sample geographic area}\right)_i}{\sum_{i=1}^{n} \left(\text{Agreed } \textit{load} \text{ per device type as per Load Table}\right)_i * \left(\text{Number of device type in the sample geographic area as per Inventory Table}\right)_i} - 1$$

where *i* = device type

is within the accuracy requirement determined in accordance with clause ~~3.8.7.~~3.8.7.

3.8.7 The accuracy requirement for the *energy data* for a type 7 *metering installation* based on the formula in clause 3.8.6, shall be +/-2.0%. Where the existing accuracy, based on the formula in clause 3.8.6, is greater than +/-2.0% then a date for reaching +/-2.0% shall be determined by the *Metrology Coordinator* in consultation with the *Responsible Person*. The accuracy requirement prior to this date will be determined by the *Metrology Coordinator* in consultation with the *Responsible Person* and the affected *Code Participants* in a transition plan which will be developed when the Inventory Table and Load Table are first agreed and the accuracy of those initial tables has been determined by the *Responsible Person*.

3.8.8 If there is an inconsistency between the data held in the *metering installation 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 data.

3.8.9 Actions in event of non-compliance with accuracy requirements are set out in Schedule 3 Ref 3.2 – 3.4 for type 5 metering installations, Schedule 4 Ref 3.2 – 3.4 for type 6 metering installations and Schedule 5 Ref 3.12 – 3.14 for type 7 metering installations.

3.9 Request for Testing of the Metering Installation

3.9.1 If requested by a *Code Participant*, the *Responsible Person* must conduct a test to determine the consistency of data held in the *metering installation database* and data held in the *meter* or *meter*/associated *data logger* of a type 5 or type 6 *metering installation*.

3.9.2 The *Responsible Person* must make available the results of the test described in clause ~~3.9.1~~3.9.1 to the *Code Participant* as soon as practicable.

3.9.3 Where the test undertaken in accordance with clause ~~3.9.1~~3.9.1 determines an inconsistency, the *Responsible Person* must pay the costs of, and associated with, that test.

3.9.4 Where the test undertaken in accordance with clause ~~3.9.1~~3.9.1 determines no inconsistency, the *Code Participant* who requested the test under clause ~~3.9.1~~3.9.1 must pay the costs of, and associated with, that test in accordance with clause 7.3.6(c) of the *Code*.

3.9.5 Where there is a discrepancy between:

(a) *energy data* stored in the *meter* or *meter*/associated *data logger*; and

(b) *energy data* stored in the *metering installation database* in respect of the respective *meter* or *meter*/associated *data logger*,

the *energy data* stored in the *meter* or *meter*/associated *data logger* is prima facie evidence of the amount of electricity *supplied* to that *metering point*.

3.9.6 If requested by a *Code Participant*, the *Responsible Person* must conduct a test to determine the accuracy of data held in the *metering installation database* and the *physical inventory* of a type 7 *metering installation*.

3.9.7 The *Responsible Person* must make available the results of the test described in clause ~~3.9.6~~3.9.6 to the *Code Participant* as soon as practicable.

3.9.8 Where the test undertaken in accordance with clause ~~3.9.6~~3.9.6 determines an error between the data held in the *metering installation database* and the *physical inventory* is more than the accuracy requirement as set out in clause ~~3.8.7,~~3.8.7, the *Responsible Person* must pay the costs of, and associated with, that test.

3.9.9 Where the test undertaken in accordance with clause ~~3.9.6~~3.9.6 determines that the error between the data held in the *metering installation database* and the *physical inventory* is within the accuracy requirement as set out in clause ~~3.8.7,~~3.8.7, the *Code Participant* who requested the test under clause ~~3.9.6~~3.9.6 must pay the costs of, and associated with, that test in accordance with clause 7.3.6(c) of the *Code*.

3.9.10 Where there is a discrepancy between the data held in the *metering installation database* and the *physical inventory*, the *physical inventory* is to be taken as prima facie evidence of the actual data.

3.9.11 If requested by a *Code Participant*, the *Responsible Person* must, prior to any test being undertaken in accordance with clause ~~3.9.1~~3.9.1 or clause ~~3.9.6,~~3.9.6, provide an estimate of the costs of, or associated with, that test.

3.9.12 Actions in event of non-compliance with accuracy requirements are set out in Schedule 3 Ref 3.2 – 3.4 for type 5 *metering installations*, Schedule 4 Ref 3.2 – 3.4 for type 6 *metering installations* and Schedule 5 Ref 3.12 – 3.14 for type 7 *metering installations*.

3.10 Validation and Substitution of Data by NEMMCO

3.10.1 *NEMMCO* must develop validation and *substitution* procedures under clause 7.9.4(b) of the *Code* in accordance with the requirements of this clause ~~3.10.~~3.10.

3.10.2 NEMMCO must prepare a *Controlled Load Profile(s) (CLP)* for each *profile area* in accordance with Schedule 10 clause 2.1 and apply the *CLP(s)* by *profile area* to the *consumption energy data* from the applicable *first tier controlled load accumulation meters* and from the applicable *second tier controlled load* type 6 *metering installations* in accordance with Schedule 10 clause 2.2 to produce *trading interval* data.

3.10.3 *NEMMCO* must prepare a *Net System Load Profile* (*NSLP*) for each *profile area* in accordance with Schedule 10 clause 3.1 and apply the *NSLP* by *profile area* to the *consumption energy data* from *second tier non-controlled load* type 6 *metering installations* in accordance with Schedule 10 clause 3.2 to produce *trading interval* data for these type 6 *metering installations*.

3.10.4 If *energy data* from type 5 or type 6 *metering installations* has not been transferred to *NEMMCO* in accordance with the *NEMMCO settlements timetable* or such data has been transferred but is unusable, *NEMMCO* must use *reasonable endeavours* to obtain the data in a

usable form in accordance with the *NEMMCO settlements timetable*. Where these *reasonable endeavours* are not successful, *NEMMCO* must *substitute* the *energy data* using the *substitution* methods available in *MSATS*.

3.10.5 *NEMMCO* must advise the affected *Code Participants* that *energy data* from *second tier loads* has been *substituted* by *NEMMCO*, at the same time as relevant data is sent to *Market Participants* for settlement.

3.10.6 *NEMMCO* must enable the transfer to *NEMMCO* of *energy data* from:

(a) interval metered first tier loads, including interval metered first tier controlled loads (sample for Controlled Load Profile(s));

(b) *accumulation metered first tier controlled loads*; and

(c) unmetered *first tier loads*.

3.10.7 If the *energy data* from *first tier loads* referred to in clause ~~3.10.6~~3.10.6 has not been transferred to *NEMMCO* in accordance with the *NEMMCO settlements timetable* or such data has been transferred but is unusable, *NEMMCO* must use *reasonable endeavours* to obtain the data in a usable form in accordance with the *NEMMCO settlements timetable*. Where these *reasonable endeavours* are not successful, *NEMMCO* must *substitute* the *energy data* for those *first tier loads* using the *substitution* methods available in *MSATS*.

3.10.8 *NEMMCO* must advise the affected *Code Participants* that *energy data* from *first tier loads* has been *substituted* by *NEMMCO*, at the same time as relevant data is sent to *Market Participants* for settlement.

3.10.9 *NEMMCO* must refer to the *market operation rules* for all requirements, additional to those provided in this clause ~~3.10,~~3.10, relating to metering of *first tier loads*, including without limitation, the quality and timeliness of the *energy data* for *first tier loads* and the party to be responsible for providing the *energy data* for *first tier loads*.

4. Disaster Recovery

(a) The *Responsible Person* must ensure that disaster recovery guidelines are prepared and developed in relation to *energy data* for *metering installations*, including the *metering installation database*.

(b) The *Responsible Person* must provide the disaster recovery guidelines prepared under clause ~~4(a)~~4(a) to *NEMMCO* on request.

(c) A disaster recovery guideline must seek to ensure that *NEMMCO's* or other *Code Participants'* systems and processes, which are dependent on the outputs of this *Metrology Procedure*, are met in the event of a system or process failure.

(d) The disaster recovery guideline must be prepared in accordance with:

(1) the relevant requirements for dispute resolution in clause 8.2 of the *Code*;

(2) the requirements for the repair of an outage or malfunction to a *metering installation* in clause 7.11 of the *Code*; and

(3) guidelines for the *substitution*, *estimation*, and calculation of *energy data*, provided in clauses ~~3.3, 3.4 and 3.5~~3.3, 3.4 and 3.5 of this *Metrology Procedure*.

5. Disputes

(a) Where a dispute arises between *Code Participants* to which this *Metrology Procedure* applies, either party may seek to have that dispute resolved under the dispute resolution mechanism established under the *Code*.

(b) In any dispute about records of the amount of electricity *supplied* to a *metering point*, clause ~~3.9.5~~3.9.5 applies for type 5 and type 6 *metering installations* and clause ~~3.9.10~~3.9.10 applies for type 7 *metering installations*.

(c) The *Responsible Person* involved in a dispute of the kind referred to in clause ~~5(a)~~5(a) must keep all records in relation to the dispute for a period of seven (7) years from the resolution of the dispute.

(d) Where a dispute arises between the *Responsible Person* and a *Metering Provider*, that dispute must be resolved in accordance with the contractual arrangements between the *Responsible Person* and the *Metering Provider*.

6. Enforcement

(a) The *Responsible Person* must comply with the *Code* (which includes an obligation to ensure its *metering installations* are provided, installed and maintained in accordance with this *Metrology Procedure)*, which is enforced by *NECA* in accordance with its enforcement powers and obligations as set out in the *National Electricity Law*.

(b) *NEMMCO* must comply with the *Code* (which includes an obligation to comply with the data validation and *substitution* procedures incorporating aspects of this *Metrology Procedure)*, which is enforced by *NECA* in accordance with its enforcement powers and obligations as set out in the *National Electricity Law*.

(c) As a point of clarification, a *Metering Provider* is required to comply with the *Metrology Procedure*, in accordance with the contractual arrangements between *NEMMCO* and the *Metering Provider* (through the accreditation and registration process), and between the *Responsible Person* and the *Metering Provider*.

7. Procedure Changes

This *Metrology Procedure* may be changed in accordance with clause 7.3.1(ba)(2) of the *Code*.

Attachment 1 - Definitions

Note: Definitions asterisked are either as per the *Code* or are similar to the definitions in the *Code*

"ACCC*" means Australian Competition and Consumer Commission as established under the Trade Practices Act 1974 (Commonwealth);

"accumulated energy data*" means the data that results from the measurement of the flow of electricity in a power conductor where the data represents a period in excess of a *trading interval*. The measurement is carried out at a *metering point*;

"accumulation meter" means a *meter* where the data recorded in the *meter* and/or *data logger* represents a period in excess of a *trading interval*;

"Act" means the Electricity Supply Act 1995 (NSW);

"active energy*" means a measure of electrical energy flow, being the time integral of the product of *voltage* and the in-phase component of current flow across a *connection point* expressed in Watthours (Wh) and multiples thereof;

"active power*" means the rate at which *active energy* is transferred;

"actual meter reading" means the physical collection of *energy data* by way of a *scheduled meter reading* or a *special meter reading;*

"Australian Standard*" or **"AS"** means the most recent edition of a standard publication by Standards Australia (Standards Association of Australia);

"Average Daily Load" means the field of that same name in *MSATS*;

"Basic Meter Profiler" means the application of the *Net System Load Profile* or the *Controlled Load Profile* to determine *trading interval* data from *consumption energy data*;

"billing period*" means the period of 7 *day*s commencing at the start of a *trading interval* ending 12.30 am Sunday;

"business day*" means a *day* other than a Saturday, Sunday or a *day* which is lawfully observed as a national public holiday on the same *day* in each of the *participating jurisdictions*;

"check metering installation*" means a *metering installation* used as the source of *metering data* for validation in the *settlements* process;

"child" means a *metering point* in an *embedded network* which is connected to a *parent* ~~or a *slave metering installation*~~;

"Code commencement date" means 13 December 1998;

"Code Participant*" means a person being:

(a) *NEMMCO*; or

(b) A person who is registered with *NEMMCO* in any one or more of the categories listed in clauses 2..2 to 2.7 of the *Code* and includes a *Network Service Provider,* a *System Operator,* a *Special Participant,* a *Generator,* a *Customer* and a *Market Participant* and includes a person who is registered with *NEMMCO* as a *Trader,* but only for the purposes referred to in clause 2.5A of the *Code*;

"communications link*" means all communications equipment, processes and arrangements that lie between the *meter* and the *data logger*, where the *data logger* is external to the device that contains the *measurement elements* and/or the *data logger* and the *telecommunications network*;

"confidential information*" means in relation to a *Code Participant*, information which is or has been provided to that *Code Participant* under or, in connection with the *Code* and which is stated under the *Code* or by *NEMMCO* or *NECA* to be confidential information or otherwise confidential or commercially sensitive or information which is derived from any such information;

"connect, connected, connection*" means to form a physical link to or through a *transmission network* or *distribution network*;

"connection assets" has the same meaning as the *National Electricity Code*;

"connection point*" means the agreed point of *supply* established between *Network Service Provider(s)* and another *Code Participant, Non-Registered Customer* or *franchise customer*;

"Consultant*" means a legal or other professional adviser, auditor or consultant;

"consumption energy data" means total *active energy* consumed over a period of time, obtained from the difference between successive *actual meter readings* at a *metering point*, or by *estimation*;

"controlled load" means those *loads* in NSW that are wired separately from other appliances, are controlled by means of frequency injection relay or time clock and are separately *metered* from the remaining *load* at the *metering point*. The majority of *controlled load* in NSW is associated with off-peak hot water;

"Controlled Load Profile" or "CLP" means a dynamic form of *load* profile that profiles only *controlled loads*;

"current transformer*" or "CT" means a *transformer* for use with *meters* and/or protection devices in which the current in the secondary winding is, within prescribed error limits, proportional to and in phase with the current in the primary winding;

"Customer*" means a person who:

1. engages in the activity of purchasing electricity *supplied* through a *transmission or distribution system*; and
2. registers with *NEMMCO* as a *Customer* in accordance with Chapter 2 of the *Code*;

"data logger*" means a metering installation database or a device that collects electronic signals from a *measurement element* and packages it into 30 minute intervals (or sub-multiples). This device may contain data storage capability, be a separate item of equipment and/or be combined with the *energy* measuring components within one physical device;

"data stream" means a stream of *energy data* or *metering data* associated with a *metering point*, as represented by a *NMI*. A *NMI* can have multiple *data streams* (e.g. from one or more *meters* or from one or more channels or registers that comprise a single *meter*). Each *data stream* is identified by a suffix, which is associated with the *NMI* to which it belongs;

"day*" means unless otherwise specified, the 24 hour period beginning and ending at midnight Eastern Standard Time (EST);

"**distribution network***" means a *network* which is not a *transmission network*;

"**distribution system***" means a *distribution network*, together with the *connection assets* associated with the *distribution network*, which is connected to another *transmission* or *distribution system*. *Connection assets* on their own do not constitute a *distribution system*;

"Distribution System Operator*" means a person who is responsible under the *Code* or otherwise, for controlling or operating any portion of a *distribution system* (including being responsible for directing its operations during *power system* emergencies) and who is registered with *NEMMCO* as such under Chapter 2 of the *Code*;

"embedded network" means a *distribution network* ~~in which end-use customers are connected to a *distribution network* that is not owned, operated or controlled by a *Local Network Service Provider*;~~to which an end-use customer is connected~~,~~ and where the *energy supplied* to the end-use customer (being a *child*) has also been registered by a *meter* used to record the consumption of another end-use customer (being a *parent*);

"energy*" means *active energy* and/or *reactive energy*;

"energy data*" means *interval energy data, accumulated energy data* or *estimated energy data.* For the purposes of this *Metrology Procedure, energy data* also refers to *consumption energy data*;

"estimated energy data*" means the data that results from an *estimation* of the flow of electricity in a power conductor where the data applies to a *trading interval* or a period in excess of a *trading interval*. The *estimation* is made in relation to a *market load* and would not apply to a *metering point*, where *accumulated energy data* or *interval energy data* is not available, or a *non-metered connection point*;

"estimated read" means an estimate used in lieu of a meter reading where ~~an *actual meter reading* has not occurred, or a *substitute* of a *meter* reading for the purposes of transferring a customer to a new *Retailer* where an *actual meter reading* has not occurred;~~

permitted in accordance with clause 3.2.9 of this Metrology Procedure. An estimated read of a type 5 metering installation is treated as an estimation for the purposes of this Metrology Procedure whilst an estimated read of a type 6 metering installation is treated as a substitution for the purposes of this Metrology Procedure;

"estimation, estimate, estimated" means an estimate of *energy data* to meet the *NEMMCO settlements timetable* where there is a delay in transferring *energy data* from *actual meter readings* to *NEMMCO*;

"final meter read" means the last *actual meter reading* for an end-use customer when they vacate an address or change *Retailer*;

"Financially Responsible*" means in relation to any *market connection point*, a term which is used to describe the *Market Participant* which has either:

1. classified the *connection point* as one of its *market loads*; or
2. classified the *generating unit connected* at that *connection point* as a *market generating unit*; or
3. classified the *network services* at that *connection point* as a *market network service;*

"first tier controlled load*" means a *controlled load* that is a *first tier load;*

"first tier load*" means the electricity purchased at a *connection point* directly and in its entirety from the *Local Retailer* and which is classified as a first tier load under Chapter 2 of the *Code*. For the purposes of this *Metrology Procedure*, a *first tier load* also includes the electricity purchased at a *connection point* directly and in its entirety from the *Local Retailer* even if it has not been so classified*;*

"franchise customer*" means a person who does not meet its local jurisdiction requirements to make it eligible to register with *NEMMCO* as a *Customer* for a *load* and who must continue to purchase electricity for that *load* from the *Local Retailer*;

"General Purpose*" means the term applied by the National Standards Commission to refer to the classification of a *meter;*

"generating system*" means a system comprising one or more *generating units*;

"generating unit*" means the actual generator of electricity and all the related equipment essential to its functioning as a single entity;

"generation*" means the production of electrical power by converting another form of *energy* in a *generating unit*;

"Generator*" means a person who engages in the activity of owning, controlling, or operating a *generating system* that *supplies* electricity to, or who otherwise *supplies* electricity to, a *transmission* or *distribution system* and who is registered with *NEMMCO* in that capacity, as described in Chapter 2 of the *Code*;

"instrument transformer*" means either a *current transformer (CT)* or a *voltage transformer (VT)*;

"interval energy data*" means the data that results from the measurement of the flow of electricity in a power conductor where the data is prepared by a *data logger* into intervals which correspond to a *trading interval* or are sub-multiples of a *trading interval*;

"interval meter" means a *meter* that records *interval energy data*;

"interval metering equipment" means equipment capable of measuring and recording electricity supplied to a customer as *interval energy data*, including *interval meters*, manual reading facilities, clocks and, where required, *current transformers* and *voltage transformers* and computing or communications equipment designed to facilitate electronic access;

"load*" means a *connection point* or defined set of *connection points* at which electrical power is delivered to a person or to another *network* or the amount of electrical power delivered at a defined instant at a *connection point*, or aggregated over a defined set of *connection points*;

"**local area/local**" means the geographical area allocated to a *Network Service Provider* by the laws of the State of New South Wales;

"Local Network Service Provider*" or "LNSP" means within a *local area*, a *Network Service Provider* to which that geographical area has been allocated by the laws of the State of New South Wales;

"Local Retailer*" means in relation to a *local area*, the *Customer* who is:

1. a business unit or *related body corporate* of the relevant *Local Network Service Provider*; or
2. responsible under the laws of New South Wales for the *supply* of electricity to *franchise customers* in that *local area*; or
3. if neither 1 or 2 is applicable, such other *Customer* as *NEMMCO* may determine;

~~**"lock down period"** means the period, as nominated from time to time by *NEMMCO*, after the *billing period*, after which the *Net System Load Profile* is not recalculated as *estimated energy data* is replaced by *energy data* from *actual meter readings* or revised *estimated energy data*;~~

"market*" means any of the markets or exchanges described in the *Code*, for so long as the market or exchange is conducted by *NEMMCO*;

"market commencement*" means the date declared as such by *NEMMCO*, on which trading in the *market* commenced;

"market connection point*" means a *connection point* where any *load* has been classified as a *market load* or which *connects* any *market generating unit* to the *national grid*, or where the *network service connected* at that *connection point* is a *market network service*;

"Market Customer*" means a *Customer* who has classified any of its *loads* as a *market load* and who is also registered with *NEMMCO* as a *Market Customer* under Chapter 2 of the *Code*;

"market generating unit" means a *generating unit* from which the sent out electricity is not purchased in its entirety by the *Local Retailer* or by a *Customer* located at the same *connection point*;

"Market Generator*" means a *Generator* who has classified at least one *generating unit* as a *market generating unit* and who is also registered with *NEMMCO* as a *Market Generator* under Chapter 2 of the *Code*;

"market load*" means a *load* at a *connection point* the electricity relating to which is purchased other than from the *Local Retailer* and which has been classified by the person *connected* at that *connection point* or, with the consent of that person, by some other person, as a *market load* pursuant to Chapter 2 of the *Code*. There can be more than one *market load* at any one *connection point*;

"market network service*" means a *network service* which is classified as a *market network service* in accordance with clause 2.5.2 of the *Code*;

"Market Network Service Provider*" means a *Network Service Provider* who has any of its *network services* classified as a *market network service*;

"market operations rule" means a market operations rule approved by the NSW Minister for Energy, as allowed for under the *Act*;

"Market Participant*" means a person who has registered with *NEMMCO* as a *Market Generator*, *Market Customer* or a *Market Network Service Provider* under Chapter 2 of the *Code*;

~~**"master metering installation**" means a *metering installation* that records the total consumption associated with an *embedded network*, including consumption at each associated *slave metering installation*;~~

"measurement element*" means an energy measuring component which converts the flow of electricity in a power conductor into an electronic signal and/or a mechanically recorded electrical measurement;

"meter*" means a device complying with *Australian Standards* which measures and records the production or consumption of electrical *energy*;

"metering data*" means the data obtained from a *metering installation*, the processed data or *substituted* data;

"metering database*" means a database of *metering data* and *settlements ready data* which may be supplied to *NEMMCO* under contract*;*

"Metering Data Agent" is an agent appointed by *NEMMCO* to undertake the *metering data* collection and processing tasks for which *NEMMCO* is responsible;

"metering data services" means the collation of *energy data* from the *meter* or *meter* and associated *data logger*, the processing of the *energy data* in the *metering installation database,* storage of the *energy data* in the *metering installation database* and the provision of access to the data for those parties that have rights of access to the data*;*

"metering installation*" means the assembly of components and/or processes that are controlled for the purpose of metrology and which lie between the *metering point(s)* or *non metered connection point* and the point of connection to the *telecommunications network*. The assembly of components may include the combination of several *metering points* to derive the *metering data* for a *connection point*. The *metering installation* must be classified as a *revenue metering installation* and/or a *check metering installation*;

"metering installation database" means that database which stores *energy data* in accordance with clause ~~3.6;~~3.6;

"metering point*" means the point of physical *connection* of the device measuring the current in the power conductor;

"Metering Provider*" means a person who meets the requirements listed in schedule 7.4 of the *Code* (which incorporates Schedules 14, 15 and 16 of this *Metrology Procedure)* and has been accredited by and is registered with *NEMMCO* as a *Metering Provider*;

"meter provision" means the provision, installation and maintenance of the *meter*, *data logger* (where required) and *CT* (where required)*;*

"Metrology Coordinator*" means a person or body appointed by the *Minister* in accordance with clause 7.2.1A of the *Code*;

"Metrology Procedure*" means a document that contains information on the devices and processes that are to be used to measure, or determine by means other than a device, the flow of electricity in a

power conductor, to convey the measured or determined data to other devices using *communication link(s)*, to prepare the data using devices or algorithms to form *metering data* and to provide access to the *metering data* from a *telecommunications network*. In relation to type 5 and 6 *metering installations*, the document may also contain the requirements for the engagement and payment of *Metering Providers* and, where applicable, must contain requirements for the provision of relevant details of the *metering installation* to the *Responsible Person*;

"Minister" means the Minister responsible for administering the National Electricity (New South Wales) Act 1997;

"MSATS" means the Market Settlement and Transfer Solution operated by *NEMMCO*;

"NATA" means the National Association of Testing Authorities;

"National Electricity Code" or "Code" means the code of that name which governs the operation of the *National Electricity Market*;

"National Electricity Law" means the provisions applying because of section 6 of the National Electricity (New South Wales) Act 1997;

"National Electricity Market" means the wholesale electricity market operated by *NEMMCO* under the *National Electricity Code*;

"national grid*" means the sum of all *connected transmission systems* and *distribution systems* within the *participating jurisdictions*;

"National Metering Identifier*" or "NMI" means a National Metering Identifier as described in clause 7.3.1(d) of the *Code*;

"NECA*" means the National Electricity Code Administrator Limited A.C.N. 073 942 775, the company responsible for administering the *Code*;

"NEMMCO*" means the National Electricity Market Management Company Limited A.C.N. 072 010 327, the company which operates and administers the *market* in accordance with the *Code*;

"NEMMCO settlements timetable" means the timeframe required for *settlements* as specified in procedures established from time-to-time by *NEMMCO*;

"Net System Load Profile" or **"NSLP"** means a dynamic form of *load* profile;

"network*" means the apparatus, equipment, plant and buildings used to convey, and control the conveyance of, electricity to customers (whether wholesale or retail) excluding any *connection assets*. In relation to a *Network Service Provider*, a *network* owned, operated or controlled by that *Network Service Provider*;

"network service*" has the same meaning as the *National Electricity Code*;

"Network Service Provider*" means a person who engages in the activity of owning, controlling, or operating a *transmission* or *distribution system* and who is registered in that capacity with *NEMMCO* under Chapter 2 of the *Code*;

"non-controlled load" means a *load* that is not a *controlled load*;

"non-metered or unmetered connection point*" means a *connection point* at which it is determined that a *meter* is not necessary in accordance with Schedule 7.2 of the *Code*;

"Non-Registered Customer*" means a person who:

1. purchases electricity through a *connection point* with the *national grid* other than from the *spot market*; and

2. is eligible to register as a *Customer* and classify the *load* described in (1) as a *first tier load* or a *second tier load*, but has not so classified the *load*;

"NSW Electricity Market Code" means the NSW State Electricity Market Code published under section 78(1)(f) of the *Act*;

"parent" means a metering point in an embedded network ~~to which *child(ren)* are connected, or a *master*~~where the energy that passes through the metering point is apportioned to more than one end-use customer, and that apportionment is made through the use of one or more child's metering installation(s) and the parent's metering installation;

"participating jurisdiction*" means a jurisdiction that is a "participating jurisdiction" under the *National Electricity Law*;

"physical inventory" means a physical count of devices;

"plant*" means in relation to a *connection point*, includes all equipment involved in generating, utilising or transmitting electrical *energy*;

"power factor*" means the ratio of the *active power* to the apparent power at a *metering point*;

"power system*" means the electricity power system of the *national grid* including associated *generation* and *transmission and distribution networks* for the *supply* of electricity, operated as an integrated arrangement;

"profile area" means, for the purposes of calculating the *Net System Load Profile*, the *TNIs* that supply the *distribution network* of the *Local Network Service Provider*. If part of the *local area* of a *Local Network Service Provider* is located within the *local area* of another *Local Network Service Provider*, for the purposes of calculating the *Net System Load Profile*, that part of the *local area* of the first *Local Network Service Provider* is considered to be part of the *profile area* of the second *Local Network Service Provider*;

"Profile Preparation Service" means the calculation of the *Net System Load Profile* and other profiles such as the *Controlled Load Profile;*

"reactive energy*" means a measure in varhours (varh) of the alternating exchange of stored energy in inductors and capacitors, which is the time-integral of the product of *voltage* and the out-of-phase component of current flow across a *connection point*;

"reasonable endeavours", in relation to a person, means the person must act in good faith and do what is reasonably necessary in the circumstances;

"Regulator*" means the person or body responsible for the regulation of transmission service pricing within a particular State or Territory, which from 1 July 1999 is the *ACCC***;**

"related body corporate*" means in relation to a body corporate, a body corporate that is related to the first-mentioned body by virtue of the Corporations Law;

"representative*" means in relation to a person, any employee, agent or *Consultant* of:

(a) that person; or

(b) a *related body corporate* of that person; or

(c) a third party contractor to that person;

"Responsible Person*" means the person who has responsibility for the provision of a *metering installation* for a particular *connection point*, being either the *Local Network Service Provider* or the *Market Participant* as described in Chapter 7 of the *Code*;

"Retailer" means an entity which holds a *retail licence*;

"retail licence" means a Retailer suppliers' licence issued by the *Minister* to *supply* or sell electricity in New South Wales in accordance with section 33 of the *Act*;

"revenue meter*" means the *meter* that is used for obtaining the primary source of *metering data*;

"revenue metering installation*" means a *metering installation* used as the primary source of *metering data* for the *settlements* process;

"sampling plan" means a statement of the sample size or sizes to be taken, the frequency of sample testing and the required accuracy;

"scheduled meter reading" means an *actual meter reading* on a cycle that equates to the end-use customer's billing cycle, usually monthly or quarterly;

"scheduled reading date" means the date of next *scheduled meter reading*;

"second tier controlled load" means a *controlled load* that is a *second tier load*;

"second tier load*" means electricity purchased at a *connection point* in its entirety from a person other than directly from the *Local Retailer* or the *spot market* which has been classified as a second tier load under Chapter 2 of the *Code*;

"second tier non-controlled load" means a *non-controlled load* that is a *second tier load*;

"second tier Retailer" means a *Retailer* other than the *Local Retailer*;

"settlements*" means the activity of producing bills and credit notes for *Market Participants*;

"settlements ready data*" means the *metering data* that has undergone a validation and *substitution* process by *NEMMCO* for the purpose of *settlements* and is delivered to the *metering database*;

~~**"slave metering installation**" means, for the purposes of this *Metrology Procedure*, a *metering installation* that is not the *master metering installation* and where the consumption of the *metering installation* is also recorded by the *master metering installation*;~~

"special meter read" means an *actual meter reading* performed outside of the usual reading cycle for the *meter*;

"Special Participant*" means a *System Operator* or a *Distribution System Operator*;

"spot market*" means the spot market established and operated by *NEMMCO* in accordance with clause 3.4.1 of the *Code*;

"substitution, substitute, substituted" means the *substitution* of an *actual meter reading* under the circumstances described in clauses 3.3.2, 3.10.4 and 3.10.7 of this *Metrology Procedure*;

"supply*" means the delivery of electricity;

"System Operator*" means a person whom *NEMMCO* has appointed as its agent under clause 4.3.3 of the *Code* to carry out some or all of *NEMMCO's* rights and obligations under Chapter 4 of the *Code* and who is registered as a System Operator with *NEMMCO* under Chapter 2 of the *Code*;

"telecommunications network*" means a telecommunications network that provides access for public use or an alternate telecommunications network that has been approved by *NEMMCO* for the delivery of *metering data*;

"time*" means Eastern Standard Time, being the time at the 150th meridian of longitude east of Greenwich in England, or Co-ordinated Universal Time, as required by the National Measurement Act, 1960;

"Trader*" means a person who has registered with *NEMMCO* under Chapter 2 of the *Code* in that capacity;

"trading interval*" means a 30 minute period ending on the hour (EST) or on the half hour and, where identified by a *time*, means the 30 minute period ending at that *time*;

"transformer*" means a *plant* or device that reduces or increases the *voltage* or alternating current;

"TransGrid" means the New South Wales Electricity Transmission Authority, trading as TransGrid and established under the Electricity Transmission Authority Act 1994 (NSW);

"transmission network*" means a *network* within any *participating jurisdiction* operating at nominal *voltages* of 220 kV and above plus:

(a) any part of a *network* operating at nominal *voltages* between 66 kV and 220 kV that operates in parallel to and provides support to the higher *voltage transmission network*;

(b) any part of a *network* operating at nominal *voltages* between 66 kV and 220 kV that does not operate in parallel to and provide support to the higher *voltage transmission network* but is deemed by the *Regulator* to be part of the *transmission network;*

"Transmission Node Identifier" or "TNI" means the unique identifier assigned by *NEMMCO* to each node in the *transmission system*;

"transmission system*" means a *transmission network*, together with the *connection assets* associated with the *transmission network*, which is connected to another *transmission* or *distribution system*;

"verifying authority*" means the authorities appointed by the National Standards Commission under the National Measurements Act (Commonwealth) 1960;

"voltage*" means the electronic force or electric potential between two points that gives rise to the flow of electricity; and

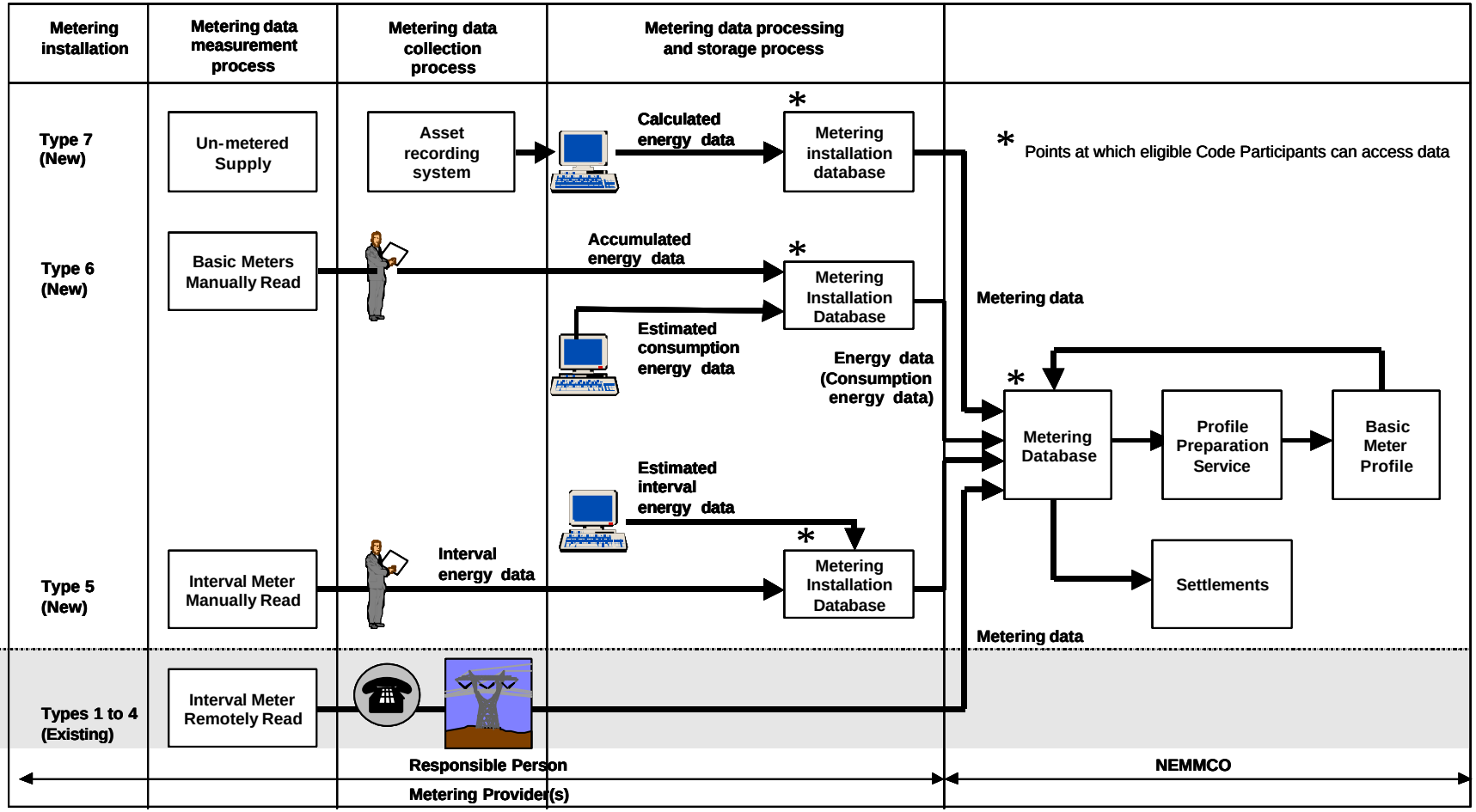
"voltage transformer*" or "VT" means a *transformer* for use with *meters* and/or protection devices in which the *voltage* across the secondary terminals is, within prescribed error limits, proportional to and in phase with the *voltage* across the primary terminals.

Attachment 2 - Interpretation

In this *Metrology Procedure*:

1. headings are only for convenience and do not affect interpretation;
2. words in the singular include the plural and the other way around;
3. words of one gender include any gender;
4. if a word or phrase is defined, another grammatical form of that word or phrase has a corresponding meaning;
5. an expression indicating a natural person includes a company, partnership, joint venture, association, corporation or other body corporate and a governmental agency;
6. a reference to a paragraph, clause, sub-clause, attachment or schedule is a reference to a paragraph, clause or sub-clause of, and a attachment or schedule to, this *Metrology Procedure* and a reference to this *Metrology Procedure* includes any annexure, attachment or schedule;
7. a reference to a thing (including, but not limited to, a right) includes any part of that thing;
8. a reference to a right includes a remedy, power, authority, discretion or benefit;
9. a reference to a regulatory instrument, including legislation, code, rule and order includes any amendment to that regulatory instrument, any consolidation or replacement of it, and any subordinate legislation made under it;
10. if a period of time is specified and dates from a given *day* or the *day* of an act or event, it is to be calculated exclusive of that *day*;
11. an event which is required under this *Metrology Procedure* to occur on or by a stipulated *day* which is not a *business day* may occur on or by the next *business day;*
12. a reference to * is a reference to a multiplication symbol, except in Attachment 1 of this *Metrology Procedure*; and
13. examples are descriptive only and not exhaustive.

Attachment 3 – Overview of Metering Installations Type 5, 6 and 7



Schedule 1 – Components of a Type 5 Metering Installation – Meter Provision

In accordance with Chapter 7 of the *Code*, the discretion available to the *Metrology Coordinator* and the result of *Code* consultation, the components and characteristics and requirements of a *Metrology Procedure* for type 5 *metering installations* (*meter provision*) are as follows.

Note: The Ref. column in this Schedule provides an internal reference number created for this *Metrology Procedure*. It is not a reference to any external document.

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.1	*Connection point*		Electricity flowing through the *connection point* is to be less than 160MWh per annum. However, at a later date, the upper limit may be adjusted by notification from the *Metrology Coordinator* to all affected *Code Participants*.		Value of "*x*" is 160 MWh per annum in accordance with Table S7.2.3.1, Note 3
1.2			The volume threshold for a *metering point* must be determined from the annual consumption for the billing periods over the most recent 12 month period, or prorated over a 12 month period based on the *Average Daily Load* where consumption over the most recent 12 month period is not available. Where no consumption data is available, the annual consumption may be *estimated* based on an engineering report or consumption data from the *loads* of similar customers. *Connection points* may not be aggregated for the purposes of determining the annual consumption.		
1.3		*Metering point*	No *check metering installation* is required.	S7.2.4(a)	
1.4			The *meter* may be either *CT* connected or direct connected.	Table S7.2.3.1	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.5~~			~~The *revenue metering point* must be located as close as practicable to the *connection point*.~~	~~7.3.2(a)(1)~~	
1.5			The *revenue metering point* must be located as close as practicable to the *connection point*..	7.3.2(a)(1)	
2.1	*Instrument transformers*	*Current transformer* (if *CT* connected)	The accuracy of the *current transformer* is to be in accordance with class 0.5.	Table S7.2.3.1	
~~2.2~~			~~New *current transformers* must meet the relevant requirements of AS1675 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.~~	~~S7.2.6.1(g)~~ ~~S7.2.2(e)~~	~~There are no "transitional arrangements" that affect *current transformers* for a type 5 *metering installation*.~~
2.2			New *current transformer*s must meet the relevant requirements of AS1675 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.	S7.2.6.1(g) S7.2.2(e)	There are no "transitional arrangements" that affect *current transformers* for a type 5 *metering installation*..
2.3			Existing *metering* class *current transformers* are permitted provided that where necessary to achieve the overall accuracy requirements: (1) *meters* of a higher class accuracy are installed; and/or (2) calibration factors are applied within the *meter* to compensate for *current transformer* errors. Where these requirements cannot be met, then an	S7.2.2(aa) S7.2.2(a) S7.2.2(b) S7.2.2(c)	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			exemption from *NEMMCO* must be obtained or the *metering installation* must be upgraded to comply with this Schedule 1.		
~~2.4~~			~~The *current transformer* core and secondary wiring associated with the *revenue meter* may be used for other purposes (e.g. local *metering* or protection) provided it is demonstrated to the satisfaction of *NEMMCO* 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*.~~	~~S7.2.6.1(b)~~	
2.4			The *current transformer* core and secondary wiring associated with the *revenue meter* may be used for other purposes (e.g. local *metering* or protection) provided it is demonstrated to the satisfaction of *NEMMCO* 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*..	S7.2.6.1(b)	
2.5			Secondary wiring must be secure and protected and be by the most direct route. The number of terminations and links must be kept to a minimum.	S7.2.6.1(d), 7.3.1(b)(3)	
2.6			The incidence and magnitude of burden changes on any secondary winding supplying the *metering installation* must be kept to a minimum.	S7.2.6.1(e)	
2.7		*Voltage transformer*	Not applicable.	Table S7.2.3.1	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
2.8		Outages	If an outage or malfunction occurs to an *instrument transformer*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~2.9~~			~~If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *instrument transformer*.~~	~~7.11(bb)~~	
2.9			If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *instrument transformer*.	7..11(bb)	
~~3.1~~	~~*Measurement element*~~	~~Design standard~~	~~*Meters* must meet the relevant requirements of AS1284 or IEC1036 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.~~	~~S7.2.6.1(f)~~	~~There are no "transitional arrangements" that affect *measurement elements* of a type 5 *metering installation*.~~
3.1	*Measurement element*	Design standard	*Meter*s must meet the relevant requirements of AS1284 or IEC1036 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.	S7.2.6.1(f)	There are no "transitional arrangements" that affect *measurement elements* of a type 5 *metering installation*..
3.2		Accuracy	The accuracy of the *measurement element* is to be in accordance with either standard AS1284 "*General Purpose* Class" or standard IEC1036 Class 1 watt-hour	Table S7.2.3.1	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			meters.		
~~3.3~~		~~Visible display~~	~~To be provided on the housing of the *meter* to display at a minimum the cumulative total *energy* for each *data stream* measured by that *metering installation*.~~	~~7.3.1(a)(1)~~	
3.3		Visible display	To be provided on the housing of the *meter* to display at a minimum the cumulative total *energy* for each *data stream* measured by that *metering installation*..	7.3.1(a)(1)	
3.4		Location	The *measurement element* must be located as close as practicable to the *connection point*.		Decision based on clause 7.3.1(a)
3.5			The *meter* is to be mounted on an appropriately constructed panel.		Decision based on clause 7.3.1(b)(4)
3.6		Security	The *measurement element* must be secure and associated links, circuits and information storage and processing systems must be secured by means of seals or other devices approved by *NEMMCO.*	7.8.1(a)	
3.7		Storage	There is no requirement for the *measurement element* to store the *active energy data* or the electronic signal output from the *measurement element*, other than through the use of the visible display.		Decision based on clause 7.3.1(a)
3.8		Access to the measurement element	The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
3.9			*Metering data* and passwords are confidential data and are to be treated as *confidential information*, subject to clause 7.7 of the *Code*, which sets out rights of access	7.10, 8.6.1	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			to data.		
3.10			Alteration to the original stored data in a *meter* will not be permitted except during on-site accuracy testing.	7.8.4	
3.11		Outages	If an outage or malfunction occurs to a *measurement element* or associated secondary wiring, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
3.12			If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *measurement element*.	7.11(bb)	
4.1	*Data logger*	Input connection	Data must be transferred from the *measurement element* to the *data logger* by secure means.		Decision based on clause 7.3.1(a)(4), 7.3.1(a)(5)
~~4.2~~		~~Design standard~~	~~Any programmable settings available within a *data logger* which may affect the resolution of displayed or stored data, must meet the relevant requirements of AS1284 or IEC1036 and must comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurements Act.~~	~~S7.2.5~~	~~There are no "transitional arrangements" that affect *data logger* for a type 5 *metering installation*.~~
4.2		Design standard	Any programmable settings available within a *data logger* which may affect the resolution of displayed or stored data, must meet the relevant requirements of	S7.2.5	There are no "transitional arrangements" that affect *data logger* for a type 5

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			AS1284 or IEC1036 and must comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurements Act.		*metering installation*..
~~4.3~~		~~Visible display~~	~~A visible display is not required on the *data logger*.~~		~~Decision based on clause 7.3.1(a)~~
4.3		Visible display	A visible display is not required on the *data logger*..		Decision based on clause 7.3.1(a)
4.4		Location	The *data logger* can be located within the same housing as the *measurement element* or in a separate housing.		Decision based on clause 7.3.1(b)(5)
4.5			If the *data logger* is located at the site of the *meter*, it is to be mounted on an appropriately constructed panel.		Decision based on clause 7.3.1(b)(4)
~~4.6~~		~~Security~~	~~The *data logger* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	
4.6		Security	The *data logger* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	
~~4.7~~		~~Processing of data~~	~~Data relating to the amount of *active energy* passing through a *connection point* must be collated in *trading intervals* within the *data logger*.~~	~~7.3.1(a)(5), 7.9.3(a)~~	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
4.7		Processing of data	Data relating to the amount of *active energy* passing through a *connection point* must be collated in *trading interval*s within the *data logger*..	7.3.1(a)(5), 7.9.3(a)	
4.8		*Time* function	The *data logger* clock is to be referenced to Australian Eastern Standard Time and maintained to a standard of +/- 300 seconds, that is, the maximum drift in the *data logger* clock permitted between successive *meter* readings is +/- 300 seconds.		Decision based on clause 7.12(a), Table S7.2.3.1 Note 3(a)
4.9		Storage	The *data logger* is to have the capability of storing *energy data* for a period of at least 200 *days*. A *data logger* installed, or which is held in store for the *Responsible Person*, prior to the effective date of the initial *Metrology Procedure* for type 5 *metering installations* is to have the capability of storing *energy data* for a period of at least two *meter* reading cycles plus 15 *days*, or 35 *days*, whichever is the greater.		Decision based on clause 7.3.1(a)(10)
4.10		Access to the *data logger*	Alteration to the original stored data in a *data logger* will not be permitted except during on-site accuracy testing.	7.8.4	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~4.11~~			~~If the *data logger* is read at the site of the *data logger*, it must have an optical port to *Australian Standard* AS1284.10.1 or AS1284.10.2 or a computer serial port and allow down loading of 90 *days* of half hourly interval data, for each *meter* connected to the *data logger*, in 35 seconds or less.~~ ~~A *CT* connected *meter* with a *data logger* with a slower download time may be used where approved by the *Metrology Coordinator.*~~		~~Decision based on clause 7.3.1(a)(5)~~
4.11			If the *data logger* is read at the site of the *data logger*, it must have an optical port to *Australian Standard* AS1284.10.1 or AS1284.10.2 or a computer serial port and allow down loading of 90 *days* of half hourly interval data, for each *meter* connected to the *data logger*, in 35 seconds or less. A *CT* connected *meter* with a *data logger* with a slower download time may be used where approved by the *Metrology Coordinator*..		Decision based on clause 7.3.1(a)(5)
4.12			The *data logger* must have provision for future connection of remote communications.		Decision based on clause 7.3.1(b)(6a)
4.13			The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~4.14~~			~~*Metering data* and passwords are confidential data and are to be treated as *confidential information*, subject to clause 7.7 of the *Code* which sets out rights of access to data.~~	~~7.10, 8.6.1~~	
4.14			*Metering data* and passwords are confidential data and are to be treated as *confidential information*, subject to clause 7.7 of the *Code* which sets out rights of access to data..	7.10, 8.6.1	
4.15		Outages	If an outage or malfunction occurs to a *data logger*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~4.16~~			~~If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *data logger*.~~	~~7.11(bb)~~	
4.16			If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *data logger*..	7.11(bb)	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~5.1~~	~~Testing~~	~~Purchase of equipment~~	~~The *metering* equipment purchased must have National Standards Commission pattern approval from an accredited laboratory recognised under the International Certification Scheme in accordance with specifications or guidelines (including transitional arrangements) specified by the National Standards Commission under the National Measurement Act. Relevant approval certificates must be provided to *NEMMCO* on request.~~	~~S7.3.1(a)~~	~~Where National Standards Commission pattern approval is not required to be provided by the National Standards Commission, *metering* equipment must be type tested by a *NATA* accredited laboratory or overseas equivalent, to AS1284.~~ ~~Refer clause 2.1.7 for grandfathering provisions.~~
5.1	Testing	Purchase of equipment	The *metering* equipment purchased must have National Standards Commission pattern approval from an accredited laboratory recognised under the International Certification Scheme in accordance with specifications or guidelines (including transitional arrangements) specified by the National Standards Commission under the National Measurement Act. Relevant approval certificates must be provided to *NEMMCO* on request.	S7.3.1(a)	Where National Standards Commission pattern approval is not required to be provided by the National Standards Commission, *metering* equipment must be type tested by a *NATA* accredited laboratory or overseas equivalent, to AS1284. Refer clause 2.1.7 for grandfathering provisions.
5.2		Inspection and testing	The testing of the *metering installation* is to be carried out as per this schedule, or in accordance with an asset	S7.3.1(c)(1),	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			management strategy that defines an alternative testing practice (ie other than time-based) determined by the *Responsible Person* and approved by *NEMMCO*.	S7.3.1(c)(2)	
5.3			The testing of the *metering installation* is to be carried out with a test plan which has been registered with *NEMMCO*, to the same requirements as for new equipment where equipment is to be recycled for use in another site, and so as to include all data storage and processing components included in this *Metrology Procedure*.	S7.3.1(c)(3), S7.3.1(c)(4), S7.3.1(c)(5)	
5.4			Appropriate test certificates are to be kept by the equipment owner.	S7.3.1(b)	
5.5			Other affected parties may witness the tests on request.	S7.3.1(d)	
5.6			The test results must be provided as soon as practicable to *NEMMCO* and to any person considered by *NEMMCO* to have a sufficient interest in the results. Each affected *Market Participant* is to be advised of the outcome of the tests, and the results of the test are to be provided to each affected *Code Participant* on request.	S7.3.1(f), 7.6.1(e)	
5.7			All reference/calibrated equipment shall be tested to ensure full traceability to Australian national measurement standards through verifying authorities or directly referenced to the National Measurement Laboratory.	S7.3.2(b)	
5.8			The calculations of accuracy based on test results, are	S7.3.2(c)	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			to include all reference standard errors.		
5.9			An "*estimate* of testing uncertainties" must be calculated in accordance with the ISO "Guide to the Expression of Uncertainty for Measurement".	S7.3.2(d)	
5.10			For cosφ refer to the ISO "Guide to the Expression of Uncertainty in Measurement", where cosφ is the *power factor.*	S7.3.2(f)	
5.11		Testing of *CT*s	The *CT*s purchased must be tested to the required class accuracy with less than ± 0.1 % uncertainty.	S7.3.1(b)	
5.12			The testing of the *CT*s in the *metering installation* is carried out as follows: ▪ Maximum allowable level of testing uncertainty in the laboratory - ± 0.1 %. ▪ Maximum allowable level of testing uncertainty in the field - ± 0.2 %. ▪ Maximum period between tests – 10 years.	S7.3.1(c), Table S7.3.1, Table S7.3.2	
5.13			*Current transformer* tests are primary injection tests or other testing procedures as approved by *NEMMCO.*	S7.3.2(a)	
5.14		Testing of *CT* connected *meter*s	The *CT* connected *meter*s purchased must be tested to the required class accuracy with less than ± 0.2/cosφ % uncertainty.	S7.3.1(b)	
5.15			The testing of the *CT* connected *meter*s in the *metering installation* is carried out as follows: ▪ Maximum allowable level of testing uncertainty in	S7.3.1(c), Table S7.3.1, Table S7.3.2	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			the laboratory - ±0.3/cosφ %. ▪ Maximum allowable level of testing uncertainty in the field - ± 0.3/cosφ %. ▪ Maximum period between tests – 5 years.		
5.16		Testing of whole-current (direct connected) *meter*s	The direct connected *meter*s purchased must be tested to the required class accuracy with less than ± 0.3/cosφ % uncertainty.	S7.3.1(b)	
~~5.17~~			~~The testing and inspection requirements must be by an asset management strategy. Guidelines for the development of the asset management strategy are provided in clause 2.4 of this *Metrology Procedure*.~~	~~Table S7.3.2~~	
5.17			The testing and inspection requirements must be by an asset management strategy. Guidelines for the development of the asset management strategy are provided in clause 2.4 of this *Metrology Procedure*..	Table S7.3.2	
5.18		*Metering installation*	*Metering installation* equipment is to be inspected when the *meter* is tested.	Table S7.3.3	
5.19			A typical inspection may include: Check the seals, compare the pulse counts, verify *meter* parameters and physical connections, check *current transformer* ratios by comparison.		Decision based on clause S7.3.2(g)
5.20		Testing by *NEMMCO*	*NEMMCO* must have unrestrained access to the *metering installation* for the purpose of testing the *metering installation* where *NEMMCO* agrees to comply with reasonable security and safety requirements and has first given at least two *business*	7.6.1(d)	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			days' notice of its intention to access the *metering installation* for the purpose of testing the *metering installation*. The notice must include the name of the *representative* who will be conducting the test on behalf of *NEMMCO*, and the *time* when the test will commence and the expected *time* when the inspection will conclude.		
5.21		Actions in event of non-compliance	If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements are made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*.	7.6.2(a)	
5.22			If a *metering installation* test, inspection or audit demonstrates errors in excess of those permitted by the *Code* and the time at which that error arose is not known, the error is deemed to have occurred at a time half way between the time of the most recent test or inspection which demonstrated that the *metering installation*, or the meter family to which the *meter* of the *metering installation* belongs, complied with the relevant accuracy requirement and the time when the error was detected.		Decision based on clause 7.9.5(a)
5.23			If a test or audit of a *metering installation* demonstrates an error of measurement of less than 1.5 times the error permitted by the *Code*, no *substitution* of readings is required unless in *NEMMCO's*		Decision based on clause 7.9.5(b)

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			reasonable opinion a particular party would be significantly affected if no *substitution* were made.		
~~6.1~~	~~Management, maintenance and auditing~~	~~Installation and maintenance~~	~~Installation and maintenance of *metering installations* must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*.~~	~~7.4.1(a), S7.4.1(f)~~	
6.1	Management, maintenance and auditing	Installation and maintenance	Installation and maintenance of *metering installation*s must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*..	7.4.1(a), S7.4.1(f)	
6.2			Any *metering* equipment installed must be suitable for the range of operating conditions to which it will be exposed (e.g. temperature; impulse levels), and operate within the defined limits for that equipment.	S7.4.1(e)	
6.3		Supporting information	Suitable drawings and supporting information, detailing the *metering installation*, must be available for maintenance and auditing purposes.	S7.2.6.1(i)	
6.4		Changes to parameters or settings	Changes to parameters or settings within a *metering installation* must be authorised by *NEMMCO* prior to the alteration being made, and be confirmed within 2 *days* of the alteration being made.	7.8.3(a), 7.8.3(b), 7.8.3(c)	
~~6.5~~		~~*NMI*~~	~~An application is to be made to the *Local Network Service Provider* for a *NMI* for each *metering installation*.~~	~~7.3.1(d)~~	
6.5		*NMI*	An application is to be made to the *Local Network Service Provider* for a *NMI* for each *metering installation*.	7.3..1(d)	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~6.6~~			~~The *NMI* must be registered with *NEMMCO* in accordance with procedures from time to time specified by *NEMMCO*.~~	~~7.3.1(db)~~	
6.6			The *NMI* must be registered with *NEMMCO* in accordance with procedures from time to time specified by *NEMMCO*..	7.3.1(db)	
6.7		Security controls	The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
6.8			Records of electronic access passwords must be kept secure.	7.8.2(b)	
6.9			"Read-only" passwords must be allocated to *Market Participant*s, *Local Network Service Provider*s and *NEMMCO*, except where separate "read-only" and "write" passwords are not available, in which case a password must be allocated to *NEMMCO*, only.	7.8.2(c)	
6.10			The *Metering Provider* must hold "read-only" and "write" passwords.	7.8.2(d)	
6.11			A copy of the passwords must be forwarded to *NEMMCO*.	7.8.2(e)	
~~6.12~~			~~*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.~~	~~7.10, 8.6.1~~	
6.12			*Metering data* and passwords are confidential data and	7.10, 8.6.1	

Schedule 1 – Type 5 Metering Installation – Meter Provision					
Ref.	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data..		
7.1	*Metering Provider*		A *Metering Provider* must be accredited by and registered with *NEMMCO*, and only for the type of work the *Metering Provider* is qualified to provide.	S7.4.1(a)	
7.2			The *Metering Provider* must have the necessary licences in accordance with appropriate State requirements.	S7.4.1(d)	
7.3		Capabilities	*Metering Providers*, who wish to apply for categories of *Metering Provider* accreditation of *metering installation* type 5, must be able to exhibit, to the reasonable satisfaction of *NEMMCO* the capabilities listed in Schedule 14.	S7.4.4	

Schedule 2 - Components of a Type 6 Metering Installation – Meter Provision

In accordance with Chapter 7 of the *Code*, the discretion of the *Metrology Coordinator* and the result of *Code* consultation, the components, characteristics and requirements of a *Metrology Procedure* for type 6 *metering installations* (*meter provision*) are as follows.

Note: The Ref. column in this Schedule provides an internal reference number created for this *Metrology Procedure*. It is not a reference to any external document.

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.1	*Connection point*		Electricity flowing through the *connection point* is to be less than 100MWh per annum.		Value of "*y*" is 100 MWh per annum in accordance with Table S7.2.3.1, Note 4.
1.2			The volume threshold for a *metering point* must be determined from the annual consumption for the billing periods over the most recent 12 month period, or prorated over a 12 month period based on the *Average Daily Load* where consumption over the most recent 12 month period is not available. Where no consumption data is available, the annual consumption may be *estimated* based on an engineering report or consumption data from the *loads* of similar customers. *Connection points* may not be aggregated for the purposes of determining the annual consumption.		
1.3		*Metering point*	No *check metering installation* is required.	S7.2.4(a)	
1.4			The *meter* may be either *CT* connected or direct connected.	Table S7.2.3.1	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.5			The *revenue metering point* must be located as close as practicable to the *connection point*.	7.3.2(a)(1)	
2.1	*Instrument transformers*	*Current transformers* (if *CT* connected)	The accuracy of the *current transformer* is to be in accordance with class 0.5.	Table S7.2.3.1	
2.2			New *current transformer*s must meet the relevant requirements of AS1675 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.	S7.2.6.1(g), S7.2.2(e)	There are no "transitional arrangements" that affect *current transformers* for a type 6 *metering installation*.
2.3			Existing *metering* class *current transformers* are permitted provided that where necessary to achieve the overall accuracy requirements: (1) *meters* of a higher class accuracy are installed; and/or (2) calibration factors are applied within the *meter* to compensate for *current transformer* errors. Where these requirements cannot be met, then an exemption from *NEMMCO* must be obtained or the *metering installation* must be upgraded to comply with this Schedule 2.	S7.2.2(aa) S7.2.2(a) S7.2.2(b) S7.2.2(c)	
2.4			The *current transformer* core and secondary wiring associated with the *revenue meter* may be used for other purposes (e.g. local *metering* or protection) provided it is demonstrated to the satisfaction of *NEMMCO* that the accuracy of the *metering*	S7.2.6.1(b)	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			installation is not compromised and suitable procedures/measures are in place to protect the security of the *metering installation*.		
2.5			Secondary wiring must be secure and protected and be by the most direct route. The number of terminations and links must be kept to a minimum.	S7.2.6.1(d) 7.3.1(b)(3)	
2.6			The incidence and magnitude of burden changes on any secondary winding supplying the *metering installation* must be kept to a minimum.	S7.2.6.1(e)	
2.7		*Voltage transformers*	Not applicable.	Table S7.2.3.1	
2.8		Outages	If an outage or malfunction occurs to an *instrument transformer*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~2.9~~			~~If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *instrument transformer*.~~	~~7.11(bb)~~	
2.9			If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *instrument transformer*..	7.11(bb)	
~~3.1~~	~~Measurement element~~	~~Design standard~~	~~*Meters* must meet the relevant requirements of AS1284 or IEC1036 and must also comply with any applicable~~	~~S7.2.6.1(f)~~	~~There are no "transitional arrangements" that affect~~

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			~~specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.~~		~~*measurement elements* of a type 6 *metering installation*. Refer clause 2.1.7 for grandfathering provisions.~~
3.1	Measurement element	Design standard	*Meter*s must meet the relevant requirements of AS1284 or IEC1036 and must also comply with any applicable specifications or guidelines (including any transitional arrangements) specified by the National Standards Commission under the National Measurement Act.	S7.2.6.1(f)	There are no "transitional arrangements" that affect *measurement elements* of a type 6 *metering installation*.. Refer clause 2.1.7 for grandfathering provisions..
3.2		Accuracy	The accuracy of the *measurement element* is to be in accordance with class 1.5 for *General Purpose* watt-hour *meters* as per AS1284 or in accordance with class 1.0 as per AS1284 or IEC1036 standards.	Table S7.2.3.1	
3.3		Visible display	To be provided on the housing of the *meter* to display at a minimum the cumulative total *energy* for each *data stream* measured by that *metering installation*.	7.3.1(a)(1)	
~~3.4~~		~~Location~~	~~The *measurement element* must be located as close as practicable to the *connection point*.~~		~~Decision based on clause 7.3.1(a)~~
3.4		Location	The *measurement element* must be located as close as practicable to the *connection point*..		Decision based on clause 7.3.1(a)
3.5			The *meter* is to be mounted on an appropriately constructed panel.		Decision based on clause 7.3.1(b)(4)
~~3.6~~		~~Security~~	~~The *measurement element* must be secure and~~	~~7.8.1(a)~~	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			~~associated links, circuits and information storage and processing systems must be secured by means of seals or other devices approved by *NEMMCO*.~~		
3.6		Security	The *measurement element* must be secure and associated links, circuits and information storage and processing systems must be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	
3.7		Access to the measurement element	Where the *energy data* held in the *metering installation* may be protected from direct or remote electronic access by suitable password and security controls, these passwords and security control must be used.		Decision based on clause 7.8.2(a)
3.8			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
3.9			Alteration to the original stored data in a *meter* will not be permitted except during on-site accuracy testing.	7.8.4	
3.10		Outages	If an outage or malfunction occurs to a *measurement element* or associated secondary wiring, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~3.11~~			~~If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *measurement element*.~~	~~7.11(bb)~~	
3.11			If an exemption is permitted by *NEMMCO*, then *NEMMCO* must be provided with a plan for the rectification of the *measurement element*..	7.11(bb)	
~~4.1~~	~~Testing~~	~~Purchase of equipment~~	~~The *meter*ing equipment purchased must have National Standards Commission pattern approval from an accredited laboratory recognised under the International Certification Scheme in accordance with specifications or guidelines (including transitional arrangements) specified by the National Standards Commission under the National Measurement Act. Relevant approval certificates must be provided to *NEMMCO* on request.~~	~~S7.3.1(a)~~	~~Where National Standards Commission pattern approval is not required to be provided by the National Standards Commission, *metering* equipment must be type tested by a *NATA* accredited laboratory or overseas equivalent, to AS1284. Refer to clause 2.1.7 for grandfathering provisions.~~
4.1	Testing	Purchase of equipment	The *meter*ing equipment purchased must have National Standards Commission pattern approval from an accredited laboratory recognised under the International Certification Scheme in accordance with specifications or guidelines (including transitional arrangements) specified by the National Standards Commission under the National Measurement Act. Relevant approval certificates must be provided to *NEMMCO* on request.	S7.3.1(a)	Where National Standards Commission pattern approval is not required to be provided by the National Standards Commission, *metering* equipment must be type tested by a *NATA* accredited laboratory or

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
					overseas equivalent, to AS1284. Refer to clause 2.1.7 for grandfathering provisions.
~~4.2~~		~~Inspection and testing~~	~~The testing of the *metering installation* is to be carried out as per this schedule, or in accordance with an asset management strategy that defines an alternative testing practice (ie other than time-based) determined by the *Responsible Person* and approved by *NEMMCO*.~~	~~S7.3.1(c)(1), S7.3.1(c)(2)~~	
4.2		Inspection and testing	The testing of the *metering installation* is to be carried out as per this schedule, or in accordance with an asset management strategy that defines an alternative testing practice (ie other than time-based) determined by the *Responsible Person* and approved by *NEMMCO*..	S7.3.1(c)(1), S7.3.1(c)(2)	
4.3			The testing of the *metering installation* is to be carried out with a test plan which has been registered with *NEMMCO*, to the same requirements as for new equipment where equipment is to be recycled for use in another site, and so as to include all data storage and processing components included in this *Metrology Procedure*.	S7.3.1(c)(3), S7.3.1(c)(4), S7.3.1(c)(5)	
4.4			Appropriate test certificates are to be kept by the equipment owner.	S7.3.1(b)	
4.5			Other affected parties may witness the tests on request.	S7.3.1(d)	
4.6			The test results must be provided as soon as practicable to *NEMMCO* and to any person considered by *NEMMCO* to have a sufficient interest in the results.	S7.3.1(f), 7.6.1(e)	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			Each affected *Market Participant* is to be advised of the outcome of the tests, and the results of the test are to be provided to each affected *Code Participant* on request.		
4.7			All reference/calibrated equipment shall be tested to ensure full traceability to Australian national measurement standards through verifying authorities or directly referenced to the National Measurement Laboratory.	S7.3.2(b)	
4.8			The calculations of accuracy based on test results, are to include all reference standard errors.	S7.3.2(c)	
4.9			An "*estimate* of testing uncertainties" must be calculated in accordance with the ISO "Guide to the Expression of Uncertainty for Measurement".	S7.3.2(d)	
4.10			For cosφ refer to the ISO "Guide to the Expression of Uncertainty in Measurement", where cosφ is the *power factor.*	S7.3.2(f)	
4.11		Testing of *CT*s	The *CT*s purchased must be tested to the required class accuracy with less than ± 0.1 % uncertainty.	S7.3.1(b)	
4.12			The testing of the *CT*s in the *metering installation* is carried out as follows: ▪ Maximum allowable level of testing uncertainty in the laboratory - ± 0.1 %. ▪ Maximum allowable level of testing uncertainty in the field - ± 0.2 %.	S7.3.1(c), Table S7.3.1, Table S7.3.2	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			▪ Maximum period between tests – 10 years.		
4.13			*Current transformer* tests are primary injection tests or other testing procedures as approved by *NEMMCO*.	S7.3.2(a)	
4.14		Testing of *CT* connected *meter*s	The *CT* connected *meter*s purchased must be tested to the required class accuracy with less than ± 0.2/cosφ % uncertainty.	S7.3.1(b)	
4.15			The testing of the *CT* connected *meter*s in the *metering installation* is carried out as follows: ▪ Maximum allowable level of testing uncertainty in the laboratory - ±0.3/cosφ %. ▪ Maximum allowable level of testing uncertainty in the field - ± 0.3/cosφ %. ▪ Maximum period between tests – 5 years.	S7.3.1(c), Table S7.3.1, Table S7.3.2	
4.16		Testing of whole-current (direct connected) *meter*s	The direct connected *meter*s purchased must be tested to the required class accuracy with less than ± 0.3/cosφ % uncertainty.	S7.3.1(b)	
~~4.17~~			~~The testing and inspection requirements must be by an asset management strategy. Guidelines for the development of the asset management strategy are provided in clause 2.3.1 of this *Metrology Procedure*.~~	~~Table S7.3.2~~	
4.17			The testing and inspection requirements must be by an asset management strategy. Guidelines for the development of the asset management strategy are provided in clause 2.3.1 of this *Metrology Procedure*..	Table S7.3.2	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
4.18		*Metering installation*	*Metering installation* equipment is to be inspected when the *meter* is tested.	Table S7.3.3	
4.19			A typical inspection may include: Check the seals, verify *meter* parameters and physical connections, check *current transformer* ratios by comparison.		Decision based on clause S7.3.2(g)
4.20		Testing by *NEMMCO*	*NEMMCO* must have unrestrained access to the *metering installation* for the purpose of testing the *metering installation* where *NEMMCO* agrees to comply with reasonable security and safety requirements and has first given at least two *business days'* notice of its intention to access the *metering installation* for the purpose of testing the *metering installation*. The notice must include the name of the *representative* who will be conducting the test on behalf of *NEMMCO*, and the *time* when the test will commence and the expected *time* when the inspection will conclude.	7.6.1(d)	
4.21		Actions in event of non-compliance	If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements are made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*.	7.6.2(a)	
4.22			If a *metering installation* test, inspection or audit demonstrates errors in excess of those permitted by the *Code* and the time at which that error arose is not known, the error is deemed to have occurred at a time		Decision based on clause 7.9.5(a)

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			half way between the time of the most recent test or inspection which demonstrated that the *metering installation*, or the meter family to which the *meter* of the *metering installation* belongs, complied with the relevant accuracy requirement and the time when the error was detected.		
4.23			If a test or audit of a *metering installation* demonstrates an error of measurement of less than 1.5 times the error permitted by the *Code*, no *substitution* of readings is required unless in *NEMMCO's* reasonable opinion a particular party would be significantly affected if no *substitution* were made.		Decision based on clause 7.9.5(b)
~~5.1~~	~~Management, maintenance and auditing~~	~~Installation and maintenance~~	~~Installation and maintenance of *metering installations* must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*.~~	~~7.4.1(a), S7.4.1(f)~~	
5.1	Management, maintenance and auditing	Installation and maintenance	Installation and maintenance of *metering installation*s must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*..	7.4.1(a), S7.4.1(f)	
5.2			Any *metering* equipment installed must be suitable for the range of operating conditions to which it will be exposed (e.g. temperature; impulse levels), and operate within the defined limits for that equipment.	S7.4.1(e)	
5.3		Supporting information	Suitable drawings and supporting information, detailing the *metering installation*, must be available for maintenance and auditing purposes.	S7.2.6.1(i)	
5.4		Changes to parameters or	Changes to parameters or settings within a *metering installation* must be authorised by *NEMMCO* prior to	7.8.3(a), 7.8.3(b),	

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
		settings	the alteration being made, and be confirmed within 2 *days* of the alteration being made.	7.8.3(c)	
5.5		*NMI*	An application is to be made to the *Local Network Service Provider* for a *NMI* for each *metering installation*.	7.3.1(d)	
~~5.6~~			~~The *NMI* must be registered with *NEMMCO* in accordance with procedures from time to time specified by *NEMMCO*.~~	~~7.3.1(db), 7.2.5(d)~~	
5.6			The *NMI* must be registered with *NEMMCO* in accordance with procedures from time to time specified by *NEMMCO*..	7.3.1(db), 7.2.5(d)	
5.7		Security controls	Where the *energy data* held in the *metering installation* may be protected from direct local or remote electronic access by suitable password and security controls, these password and security controls must be used.		Decision based on clause 7.8.2(a)
5.8			Records of electronic access passwords must be kept secure.	7.8.2(b)	Only applicable if passwords used
5.9			"Read-only" passwords must be allocated to *Market Participant*s, *Local Network Service Provider*s and *NEMMCO*, except where separate "read-only" and "write" passwords are not available, in which case a password must be allocated to *NEMMCO*, only.	7.8.2(c)	Only applicable if passwords used
5.10			The *Metering Provider* must hold "read-only" and "write" passwords.	7.8.2(d)	Only applicable if passwords used

Schedule 2 – Type 6 Metering Installation – Meter Provision					
Ref	**Components of metering equipment**	**Characteristics of metering equipment**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
5.11			A copy of the passwords must be forwarded to *NEMMCO.*	7.8.2(e)	Only applicable if passwords used
~~5.12~~			~~*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.~~	~~7.10, 8.6.1~~	
5.12			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data..	7.10, 8.6.1	
6.1	*Metering Provider*		A *Metering Provider* must be accredited by and registered with *NEMMCO*, and only for the type of work the *Metering Provider* is qualified to provide.	S7.4.1(a)	
6.2			The *Metering Provider* must have the necessary licences in accordance with appropriate State requirements.	S7.4.1(d)	
6.3		Capabilities	*Metering Providers*, who wish to apply for categories of *Metering Provider* accreditation of *metering installation* type 6, must be able to exhibit, to the reasonable satisfaction of *NEMMCO* the capabilities listed in Schedule 15.	S7.4.4	

Schedule 3 – Components of a Type 5 Metering Installation – Metering Data Services

In accordance with Chapter 7 of the *Code*, the discretion available to the *Metrology Coordinator* and the result of *Code* consultation, the components and characteristics and requirements of a *Metrology Procedure* for type 5 *metering installations* (*metering data services*) are as follows.

Note: The Ref. column in this Schedule provides an internal reference number created for this *Metrology Procedure*. It is not a reference to any external document.

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.1~~	~~*Metering installation database*~~	~~Location~~	~~The *metering installation database* is located at a site remote from the site of a *meter*.~~		~~Decision based on clause 7.3.1(b)(5)~~
1.1	*Metering installation database*	Location	The *metering installation database* is located at a site remote from the site of a *meter*..		Decision based on clause 7.3.1(b)(5)
~~1.2~~		~~Security~~	~~The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	
1.2		Security	The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.3~~		~~Processing and storage of data~~	~~The original *energy* readings must be stored in the *metering installation database*.~~ ~~Data relating to the amount of *active energy* passing through a *connection point* must be collated and stored by *data stream* in half hourly *trading intervals* within the *metering installation database*. The *energy data* may be *substituted* in accordance with clause 3.3 or *estimated* in accordance with clause 3.4 of this *Metrology Procedure*.~~	~~7.3.1(a)(5), 7.9.3(a)~~	~~*NEMMCO* accredits *Metering Providers* to validate and *substitute actual meter readings* from type 5 *metering installations*.~~
1.3		Processing and storage of data	The original *energy* readings must be stored in the *metering installation database*..	7.3.1(a)(5), 7.9.3(a)	*NEMMCO* accredits *Metering Providers* to validate and *substitute actual meter readings* from type 5 *metering installations*..
			Data relating to the amount of *active energy* passing through a *connection point* must be collated and stored by *data stream* in half hourly *trading interval*s within the *metering installation database*. The *energy data* may be *substituted* in accordance with clause 3.3 or *estimated* in accordance with clause 3.4 of this *Metrology Procedure*..		
1.4			The *metering installation* may provide delays in transferring the *interval energy data* to a remote location where access to a *telecommunications network* has been established. During the period of delay the *interval energy data* will be established using *estimation*, as per Schedule 7.		Decision based on Table S7.2.3.1 Note 3
1.5			The *metering installation database* must store *energy data* for a period of at least 35 *days*. Where the *energy data* stored in the *metering*		Decision based on clause 7.3.1(a)(11)

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			installation database is not stored elsewhere by the *Responsible Person* and is not stored in the *metering database*, the *energy data* must be stored in the *metering installation database* for a period of at least 13 months on line in accessible format and for a further period of 5 years and 11 months in archive that is accessible independently of the format in which the data is stored.		
1.6		*Time* function	The *metering installation database* clock is to be referenced to Australian Eastern Standard Time and maintained to a standard of +/- 20 seconds.	7.12(a), Table S7.2.3.1	
~~1.7~~		~~Access to the *metering installation database*~~	~~The *metering installation database* must have electronic data transfer facilities to transfer the data from the *metering installation* to the *metering database*.~~	~~7.3.1(a)(3), 7.3.1(a)(8)~~	
1.7		Access to the *metering installation database*	The *metering installation database* must have electronic data transfer facilities to transfer the data from the *metering installation* to the *metering database*..	7.3.1(a)(3), 7.3.1(a)(8)	
1.8			The format of the data must be in accordance with the interface specification as nominated from time-to-time by *NEMMCO*.		
1.9			The *energy data* held in the *metering installation* is to be protected from direct or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
1.10			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to	7.10, 8.6.1	

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			clause 7.7 of the *Code* which sets out rights of access to data.		
~~1.11~~			~~The only persons entitled to have either direct or remote access to *metering data* from *a metering installation* in relation to a *connection point* are *Code Participants* whose *NEMMCO* account statement relates to *energy* flowing through that *connection point*, the *Metering Provider(s)* who has an agreement to service the *metering installation*, in which case access is to be restricted only to allow authorised work, the *Network Service Providers* associated with the connection point, *NEMMCO* and *NECA* and its authorised agents, and any *Customer* who is registered with *NEMMCO* and who purchases *electricity* at the associated *connection point*.~~		~~Decision based on clause 7.7(a)~~
1.11			The only persons entitled to have either direct or remote access to *metering data* from *a metering installation* in relation to a *connection point* are *Code Participants* whose *NEMMCO* account statement relates to *energy* flowing through that *connection point*, the *Metering Provider(s)* who has an agreement to service the *metering installation*, in which case access is to be restricted only to allow authorised work, the *Network Service Providers* associated with the connection point, *NEMMCO* and *NECA* and its authorised agents, and any *Customer* who is registered with *NEMMCO* and who purchases *electricity* at the associated *connection point*..		Decision based on clause 7.7(a)

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.12			Electronic access to *metering data* from a *metering installation* shall only be provided where passwords in accordance with clause 7.8.2 of the *Code* are allocated.	7.7(b)	
1.13			Access to *metering data* from the *metering installation*, by those who have rights of access, must be scheduled appropriately to ensure that congestion does not occur.	7.7(c)	
1.14		Performance	*Energy data* is required for all *trading intervals* at the following level of accuracy, or for *General Purpose* watt hour *meters*, at the level of accuracy as per AS1284. Power Factor		Decision based on clause 7.11(aa)(1) and S7.2.3
			% Rated Load / Unity / 0.866 lagging / 0.5 lagging 10 / 2.0% / 2.0% / n/a 50 / 1.5% / 1.5% / 1.5% 100 / 1.5% / 1.5% / n/a Notes: 1. All measurements to be referred to 23 +/- 2 degrees Celsius. 2. The method for calculating the overall error is the vector sum of the errors of each component part, ie a + b, where a = the error of the *current transformer* and wiring b = the error of the *meter*.		

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			The following transitional arrangement exists for those *metering installations* in use at *market commencement* that were required to comply with, and did comply with, the *NSW Electricity Market Code* at the *Code commencement date*. Existing *metering installations* must meet the *Code* requirements by 10 May 1997 unless the *Responsible Person* has been granted an extension of the period of transitional provisions under the NSW Electricity Market Code by *TransGrid* (which extension must end on or before 31 December 2002), in which case the *Responsible Person* must ensure that the *metering installation* complies with the accuracy level specified in Chapter 7 of the *Code* by the date specified in the extension granted by *TransGrid*.	9.17.1, 9.17.3 (d)	
~~1.15~~			~~*Energy data* (either actual, *substituted* or *estimated*) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) within the timeframe required for *settlements* as specified in procedures established by *NEMMCO*.~~		~~Decision based on clause 7.11(aa)(2)~~
1.15			*Energy data* (either actual, *substituted* or *estimated*) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) within the timeframe required for *settlements* as specified in procedures established by *NEMMCO*..		Decision based on clause 7.11(aa)(2)

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.16~~			~~*Energy data* (either actual, *substituted* or *estimated*) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) in accordance with performance standards established by *NEMMCO*.~~		~~Decision based on clause 7.11(aa)(3)~~
1.16			*Energy data* (either actual, *substituted* or *estimated*) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) in accordance with performance standards established by *NEMMCO*..		Decision based on clause 7.11(aa)(3)
~~1.17~~		~~Outages~~	~~If an outage or malfunction occurs to a *metering installation database*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).~~	~~7.11(b)~~	~~If an outage or malfunction occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.~~
1.17		Outages	If an outage or malfunction occurs to a *metering installation database*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	If an outage or malfunction occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.18~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*.~~	~~7.11(bb)~~	
1.18			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*..	7.11(bb)	
~~2.1~~	~~*Communications link*~~	~~Location~~	~~(Comment provided for explanation only)~~	~~7.3.1(a)(3a), 7.2.5(bb)~~	~~The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*.~~
2.1	*Communications link*	Location	(Comment provided for explanation only)	7.3.1(a)(3a), 7.2.5(bb)	The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*..
2.2			(Comment provided for explanation only)	7.3.1(b)(6a)	The electronic connection between the *data logger* and the *metering installation database* is classified as a *communications link*.

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~2.3~~			~~(Comment provided for explanation only)~~		~~A *communications link* may consist of a manual *meter* reading process and a *metering installation database*.~~
2.3			(Comment provided for explanation only)		A *communications link* may consist of a manual *meter* reading process and a *metering installation database*..
2.4		Modem	(Comment provided for explanation only)		A modem is used to connect the *metering installation database* to the *telecommunications network*.
2.5		Remote acquisition of data	(Comment provided for explanation only)	7.3.5(b), 7.9.2(a)	*NEMMCO* is responsible for the remote acquisition of the *metering data* from the *metering installation*
2.6			Relevant *energy data* must be provided to *NEMMCO* or its agent should a failure of the remote acquisition facility occur, and such an arrangement has been made by *NEMMCO.*		Decision based on clauses 7.9.2(b) and 7.12(aa)
2.7			Access to the *metering installation database* from a *telecommunications network* must be provided to facilitate the remote acquisition of data.	7.2.5(bc)	
2.8			The *energy data* held in the *metering installation* is to		Decision based on clause

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			be protected from direct local or remote electronic access by suitable password and security controls.		7.8.2(a)
2.9			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
~~2.10~~		~~Security~~	~~The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	
2.10		Security	The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	
2.11		Outages	If an outage or malfunction occurs to a *communications link*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~2.12~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *communications link*.~~	~~7.11(bb)~~	
2.12			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the	7.11(bb)	

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			rectification of the *communications link*..		
3.1	Testing	Testing by *NEMMCO*	*NEMMCO* must have unrestrained access to the *metering installation* for the purpose of testing the *metering installation* where *NEMMCO* agrees to comply with reasonable security and safety requirements and has first given at least two *business days'* notice of its intention to access the *metering installation* for the purpose of testing the *metering installation*. The notice must include the name of the *representative* who will be conducting the test on behalf of *NEMMCO*, and the *time* when the test will commence and the expected *time* when the inspection will conclude.	7.6.1(d)	
~~3.2~~		~~Actions in event of non-compliance~~	~~If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements are made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*.~~	~~7.6.2(a)~~	
3.2		Actions in event of non-compliance	If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements are made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*..	7.6.2(a)	
3.3			If a *metering installation* test, inspection or audit		Decision based on clause

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			demonstrates errors in excess of those permitted by the *Code* and the time at which that error arose is not known, the error is deemed to have occurred at a time half way between the time of the most recent test or inspection which demonstrated that the *metering installation*, or the meter family to which the *meter* of the *metering installation* belongs, complied with the relevant accuracy requirement and the time when the error was detected.		7.9.5(a)
3.4			If a test or audit of a *metering installation* demonstrates an error of measurement of less than 1.5 times the error permitted by the *Code*, no *substitution* of readings is required unless in *NEMMCO's* reasonable opinion a particular party would be significantly affected if no *substitution* were made.		Decision based on clause 7.9.5(b)
~~4.1~~	~~Management, maintenance and auditing~~	~~Installation and maintenance~~	~~Installation and maintenance of *metering installations* must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*.~~	~~7.4.1(a), S7.4.1(f)~~	
4.1	Management, maintenance and auditing	Installation and maintenance	Installation and maintenance of *metering installation*s must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*..	7.4.1(a), S7.4.1(f)	
4.2		Security controls	The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
4.3			Records of electronic access passwords must be kept secure.	7.8.2(b)	
4.4			"Read-only" passwords must be allocated to *Market*	7.8.2(c)	

Schedule 3 – Type 5 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			Participants, *Local Network Service Providers* and *NEMMCO*, except where separate "read-only" and "write" passwords are not available, in which case a password must be allocated to *NEMMCO*, only.		
4.5			The *Metering Provider* must hold "read-only" and "write" passwords.	7.8.2(d)	
~~4.6~~			~~A copy of the passwords must be forwarded to *NEMMCO*.~~	~~7.8.2(e)~~	
4.6			A copy of the passwords must be forwarded to *NEMMCO*..	7.8.2(e)	
4.7			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
5.1	*Metering Provider*		A *Metering Provider* must be accredited by and registered with *NEMMCO*, and only for the type of work the *Metering Provider* is qualified to provide.	S7.4.1(a)	
5.2			The *Metering Provider* must have the necessary licences in accordance with appropriate State requirements.	S7.4.1(d)	
5.3		Capabilities	*Metering Providers*, who wish to apply for categories of *Metering Provider* accreditation of *metering installation* type 5, must be able to exhibit, to the reasonable satisfaction of *NEMMCO* the capabilities listed in Schedule 14.	S7.4.4	

Schedule 4 – Components of a Type 6 Metering Installation – Metering Data Services

In accordance with Chapter 7 of the *Code*, the discretion available to the *Metrology Coordinator* and the result of *Code* consultation, the components and characteristics and requirements of a *Metrology Procedure* for type 6 *metering installations* (*metering data services*) are as follows.

Note: The Ref. column in this Schedule provides an internal reference number created for this *Metrology Procedure*. It is not a reference to any external document.

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.1~~	~~*Metering installation database*~~	~~Location~~	~~The *metering installation database* is located at a site remote from the site of a *meter*.~~		~~Decision based on clause 7.3.1(b)(5)~~
1.1	*Metering installation database*	Location	The *metering installation database* is located at a site remote from the site of a *meter*..		Decision based on clause 7.3.1(b)(5)
~~1.2~~		~~Security~~	~~The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	
1.2		Security	The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~1.3~~		~~Processing and storage of data~~	~~The original *energy* readings must be stored in the *metering installation database*.~~ ~~Data relating to the amount of *active energy* passing through a *connection point* must be collated and stored by *data stream* within the *metering installation database*. The *consumption energy data* (either actual, *substituted* in accordance with clause 3.3 of this *Metrology Procedure*, or *estimated* in accordance with clause 3.4 of this *Metrology Procedure*) must also be calculated and stored by *data stream* within the *metering installation database*.~~	~~7.3.1(a)(5), 7.9.3(b)~~	~~*NEMMCO* accredits *Metering Providers* to validate and *substitute actual meter readings* from type 6 *metering installations*.~~
1.3		Processing and storage of data	The original *energy* readings must be stored in the *metering installation database*.. Data relating to the amount of *active energy* passing through a *connection point* must be collated and stored by *data stream* within the *metering installation database*. The *consumption energy data* (either actual, *substituted* in accordance with clause 3.3 of this *Metrology Procedure*, or *estimated* in accordance with clause 3.4 of this *Metrology Procedure*) must also be calculated and stored by *data stream* within the *metering installation database*.	7.3.1(a)(5), 7.9.3(b)	*NEMMCO* accredits *Metering Providers* to validate and *substitute actual meter readings* from type 6 *metering installations*..
1.4			The *metering installation* may provide delays in transferring the *consumption energy data* to a remote location where access to a *telecommunications network* has been established. During the period of delay the *consumption energy data* will be established using *estimation* as per Schedule 9.		Decision based on Table S7.2.3.1 Note 4

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.5			The *metering installation database* must store *energy data* for a period of at least 35 *days*. Where the *energy data* stored in the *metering installation database* is not stored elsewhere by the *Responsible Person* and is not stored in the *metering database*, the *energy data* must be stored in the *metering installation database* for a period of at least 13 months on line in accessible format and for a further period of 5 years and 11 months in archive that is accessible independently of the format in which the data is stored.		Decision based on clause 7.3.1(a)(10)
~~1.6~~			~~The *consumption energy data* is converted into *trading interval data* in the *NEMMCO* validation and *substitution* procedure by applying the profiles in accordance with clauses 3.10.2 and 3.10.3.~~	~~7.9.3(b)~~	
1.6			The *consumption energy data* is converted into *trading interval data* in the *NEMMCO* validation and *substitution* procedure by applying the profiles in accordance with clauses 3.10.2 and 3.10.3.	7.9.3(b)	
1.7		*Time* function	The *metering installation database* clock is to be referenced to Australian Eastern Standard Time and maintained to a standard of +/- 20 seconds.	7.12(a), Table S7.2.3.1	
~~1.8~~		~~Access to the *metering installation database*~~	~~The *metering installation database* must have electronic data transfer facilities to transfer the data from the *metering installation* to the *metering database*.~~	~~7.3.1(a)(3), 7.3.1(a)(8), 7.3.5(b)~~	
1.8		Access to the *metering*	The *metering installation database* must have	7.3.1(a)(3),	

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
		installation database	electronic data transfer facilities to transfer the data from the *metering installation* to the *metering database*..	7.3.1(a)(8), 7.3.5(b)	
1.9			The format of the data must be in accordance with the interface specification as nominated from time-to-time by *NEMMCO*.		
1.10			The *energy data* held in the *metering installation* is to be protected from direct or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
1.11			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
1.12			The only persons entitled to have either direct or remote access to *metering data* from a *metering installation* in relation to a *connection point* are *Code Participants* whose *NEMMCO* account statement relates to *energy* flowing through that *connection point*, the *Metering Provider(s*) who has an agreement to service the *metering installation*, in which case access is to be restricted only to allow authorised work, the *Network Service Providers* associated with the connection point, *NEMMCO* and *NECA* and its authorised agents, and any *Customer* who is registered with *NEMMCO* and who purchases *electricity* at the associated *connection point*.		Decision based on clause 7.7(a)
1.13			Electronic access to *metering data* from a *metering installation* shall only be provided where passwords in	7.7(b)	

<table>
<tr><th colspan="6">Schedule 4 – Type 6 Metering Installation – Metering Data Services</th></tr>
<tr><th>Ref.</th><th>Components of metering data services</th><th>Characteristics of metering data services</th><th>Requirement</th><th>Clause in Code</th><th>Metrology Coordinator Decision/Comment</th></tr>
<tr><td></td><td></td><td></td><td>accordance with clause 7.8.2 of the Code are allocated.</td><td></td><td></td></tr>
<tr><td>1.14</td><td></td><td></td><td>Access to metering data from the metering installation, by those who have rights of access, must be scheduled appropriately to ensure that congestion does not occur.</td><td>7.7(c)</td><td></td></tr>
<tr><td>1.15</td><td></td><td>Performance</td><td>Energy data is required at the following level of accuracy, or for General Purpose watt hour meters, at the level of accuracy as per AS1284.

Power Factor
% Rated Load | Unity | 0.866 lagging | 0.5 lagging
10 | 2.0% | 2.0% | n/a
50 | 1.5% | 1.5% | 1.5%
100 | 1.5% | 1.5% | n/a
Notes:
1. All measurements to be referred to 23 +/- 2 degrees Celsius.
2. The method for calculating the overall error is the vector sum of the errors of each component part, ie a + b,
where
a = the error of the current transformer and wiring
b = the error of the meter.</td><td></td><td>Decision based on clause 7.11(aa)(1) and S7.2.3</td></tr>
<tr><td></td><td></td><td></td><td>The following transitional arrangement exists for those metering installations in use at market commencement</td><td>9.17.1, 9.17.3 (d)</td><td></td></tr>
</table>

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			that were required to comply with, and did comply with, the *NSW Electricity Market Code* at the *Code commencement date*. Existing *metering installations* must meet the *Code* requirements by 10 May 1997 unless the *Responsible Person* has been granted an extension of the period of transitional provisions under the NSW Electricity Market Code by *TransGrid* (which extension must end on or before 31 December 2002), in which case the *Responsible Person* must ensure that the *metering installation* complies with the accuracy level specified in Chapter 7 of the *Code* by the date specified in the extension granted by *TransGrid*.		
1.16			*Consumption energy data* (actual, *substituted* or *estimated*) is required by *NEMMCO* by *data stream* within the timeframe required for *settlements* as specified in procedures established by *NEMMCO.*		Decision based on clause 7.11(aa)(2)
1.17			*Consumption energy data* (actual, *substituted* or *estimated*) is required by *NEMMCO* in accordance with performance standards established by *NEMMCO.*		Decision based on clause 7.11(aa)(3)
~~1.18~~		~~Outages~~	~~If an outage or malfunction occurs to a *metering installation database*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).~~	~~7.11(b)~~	~~If an outage or malfunction occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.~~
1.18		Outages	If an outage or malfunction occurs to a *metering*	7.11(b)	If an outage or malfunction

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			installation database, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).		occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.
~~1.19~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*.~~	~~7.11(bb)~~	
1.19			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*..	7.11(bb)	
~~2.1~~	~~*Communications link*~~	~~Location~~	~~(Comment provided for explanation only)~~	~~7.3.1(a)(3a), 7.2.5(bb)~~	~~The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*.~~
2.1	*Communications link*	Location	(Comment provided for explanation only)	7.3.1(a)(3a), 7.2.5(bb)	The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*..

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
2.2			(Comment provided for explanation only)	7.3.1(b)(6a)	The electronic connection between the *meter* and the *metering installation database* is classified as a *communications link*.
~~2.3~~			~~(Comment provided for explanation only)~~		~~*A communications link* may consist of a manual *meter* reading process and *a metering installation database.*~~
2.3			(Comment provided for explanation only)		A *communications link* may consist of a manual *meter* reading process and a *metering installation database*..
2.4		Modem	(Comment provided for explanation only)		A modem is used to connect the *metering installation database* to the *telecommunications network*.
~~2.5~~		~~Remote acquisition of data~~	~~(Comment provided for explanation only)~~	~~7.3.5(b), 7.9.2(a)~~	~~*NEMMCO* is responsible for the remote acquisition of the *metering data* from the *metering installation.*~~
2.5		Remote acquisition of data	(Comment provided for explanation only)	7.3.5(b), 7.9.2(a)	*NEMMCO* is responsible for the remote acquisition of the *metering data* from

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
					the *metering installation*..
2.6			Relevant *energy data* must be provided to *NEMMCO* or its agent should a failure of the remote acquisition facility occur, and such an arrangement has been made by *NEMMCO.*		Decision based on clause 7.9.2(b)
2.7			Access to the *metering installation database* from a *telecommunications network* must be provided to facilitate the remote acquisition of data.	7.2.5(bc), 7.12(aa)	
2.8			The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
2.9			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
~~2.10~~		~~Security~~	~~The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO.*~~	~~7.8.1(a)~~	
2.10		Security	The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
2.11		Outages	If an outage or malfunction occurs to a *communications link*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such *time* as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~2.12~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *communications link*.~~	~~7.11(bb)~~	
2.12			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *communications link*..	7.11(bb)	
3.1	Testing	Testing by *NEMMCO*	*NEMMCO* must have unrestrained access to the *metering installation* for the purpose of testing the *metering installation* where *NEMMCO* agrees to comply with reasonable security and safety requirements and has first given at least two *business days'* notice of its intention to access the *metering installation* for the purpose of testing the *metering installation*. The notice must include the name of the *representative* who will be conducting the test on behalf of *NEMMCO*, and the *time* when the test will commence and the expected *time* when the inspection will conclude.	7.6.1(d)	

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~3.2~~		~~Actions in event of non-compliance~~	~~If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*.~~	~~7.6.2(a)~~	
3.2		Actions in event of non-compliance	If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*..	7.6.2(a)	
3.3			If a *metering installation* test, inspection or audit demonstrates errors in excess of those permitted by the *Code* and the time at which that error arose is not known, the error is deemed to have occurred at a time half way between the time of the most recent test or inspection which demonstrated that the *metering installation*, or the meter family to which the *meter* of the *metering installation* belongs, complied with the relevant accuracy requirement and the time when the error was detected.		Decision based on clause 7.9.5(a)
3.4			If a test or audit of a metering installation demonstrates an error of measurement of less than 1.5 times the error no *substitution* of readings is required unless in *NEMMCO's* reasonable opinion a particular party would be significantly affected if no *substitution* were		Decision based on clause 7.9..5(b)

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			made.		
~~4.1~~	~~Management, maintenance and auditing~~	~~Installation and maintenance~~	~~Installation and maintenance of *metering installations* must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*.~~	~~7.4.1(a), S7.4.1(f)~~	
4.1	Management, maintenance and auditing	Installation and maintenance	Installation and maintenance of *metering installation*s must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*..	7.4.1(a), S7.4.1(f)	
4.2		Security controls	The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
4.3			Records of electronic access passwords must be kept secure.	7.8.2(b)	
4.4			"Read-only" passwords must be allocated to *Market Participant*s, *Local Network Service Provider*s and *NEMMCO*, except where separate "read-only" and "write" passwords are not available, in which case a password must be allocated to *NEMMCO*, only.	7.8.2(c)	
4.5			The *Metering Provider* must hold "read-only" and "write" passwords.	7.8.2(d)	
~~4.6~~			~~A copy of the passwords must be forwarded to *NEMMCO*.~~	~~7.8.2(e)~~	
4.6			A copy of the passwords must be forwarded to *NEMMCO*..	7.8.2(e)	
4.7			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to	7.10, 8.6.1	

Schedule 4 – Type 6 Metering Installation – Metering Data Services					
Ref.	**Components of metering data services**	**Characteristics of metering data services**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			clause 7.7 of the *Code* which sets out rights of access to data.		
5.1	*Metering Provider*		A *Metering Provider* must be accredited by and registered with *NEMMCO*, and only for the type of work the *Metering Provider* is qualified to provide.	S7.4.1(a)	
5.2			The *Metering Provider* must have the necessary licences in accordance with appropriate State requirements.	S7.4.1(d)	
5.3		Capabilities	*Metering Providers*, who wish to apply for categories of *Metering Provider* accreditation of *metering installation* type 6, must be able to exhibit, to the reasonable satisfaction of *NEMMCO* the capabilities listed in Schedule 15.	S7.4.4	

Schedule 5 – Components of a Type 7 Metering Installation – Metering Data Services

In accordance with Chapter 7 of the *Code*, the discretion available to the *Metrology Coordinator* and the result of *Code* consultation, the components and characteristics and requirements of a *metrology procedure* for type 7 *metering installations* (*metering data services*) are as follows.

Note: The Ref. column in this Schedule provides an internal reference number created for this *Metrology Procedure*. It is not a reference to any external document.

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
1.1			A type 7 *metering installation* applies only to those *load*s agreed between the *Metrology Coordinator* and *NEMMCO* for which 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 *energy data* that is deemed to flow in the power conductor (refer Schedule 11 clause 1).	Table S7.2.3.1 Note 5	*Load*s agreed between the *Metrology Coordinato*r and *NEMMCO* are published by the *Metrology Coordinator*.
~~2.1~~	~~*Metering installation database*~~	~~Location~~	~~The *metering installation database* is located at a site remote from the unmetered *load*.~~		~~Decision based on clause 7.3.1(b)(5)~~
2.1	*Metering installation database*	Location	The *metering installation database* is located at a site remote from the unmetered *load*..		Decision based on clause 7.3.1(b)(5)
~~2.2~~		~~Security~~	~~The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	
2.2		Security	The *metering installation database* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of	7.8.1(a)	

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			seals or other devices approved by *NEMMCO*..		
~~2.3~~		~~Processing and storage of data~~	~~Data relating to the amount of *active energy* consumed by the unmetered *load* must be calculated, validated and *substituted* where required, and stored by *NMI data stream* in half hourly *trading intervals* within the *metering installation database* in accordance with clause 3.5 and Schedule 11. The Load Tables, Inventory Tables and On/Off Tables must also be stored in the *metering installation database*.~~	~~7.9.3(b)~~	~~*NEMMCO* accredits *Metering Providers* to validate and *substitute energy data* calculated for type 7 *metering installations*.~~
2.3		Processing and storage of data	Data relating to the amount of *active energy* consumed by the unmetered *load* must be calculated, validated and *substituted* where required, and stored by *NMI data stream* in half hourly *trading intervals* within the *metering installation database* in accordance with clause 3.5 and Schedule 11.. The Load Tables, Inventory Tables and On/Off Tables must also be stored in the *metering installation database*.	7.9.3(b)	*NEMMCO* accredits *Metering Providers* to validate and *substitute energy data* calculated for type 7 *metering installations*..
2.4			The *metering installation database* must store *energy data* for a period of at least 35 *days*. The *metering installation database* must store Load Tables, Inventory Tables and On/Off Tables for a period of at least 13 months on line in an accessible format, and for a further 5 years and 11 months in archive that is accessible independently of the format in which the data is stored, unless these tables are stored in another database for the same period of time and in the same format.		Decision based on clause 7.3.1(a)(12)

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
2.5		Access to the *metering installation database*	The *metering installation database* must have electronic data transfer facilities to transfer the *energy data* from the *metering installation* to the *metering database*.	7.3.1(a)(3), 7.3.1(a)(8), 7.3.5(b)	
2.6			The format of the data must be in accordance with the interface specification as nominated from time-to-time by *NEMMCO*.		
2.7			The *energy data* held in the *metering installation* is to be protected from direct or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
2.8			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
~~2.9~~			~~The only persons entitled to have either direct or remote access to *metering data* from *a metering installation* in relation to a *connection point* are *Code Participants* whose *NEMMCO* account statement relates to *energy* flowing through that *connection point*, the *Metering Provider(s)* who has an agreement to service the *metering installation*, in which case access is to be restricted only to allow authorised work, the *Network Service Providers* associated with the connection point, *NEMMCO* and *NECA* and its authorised agents, and any *Customer* who is registered with *NEMMCO* and who purchases *electricity* at the associated *connection point*.~~		~~Decision based on clause 7.7(a)~~

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
2.9			The only persons entitled to have either direct or remote access to *metering data* from *a metering installation* in relation to a *connection point* are *Code Participants* whose *NEMMCO* account statement relates to *energy* flowing through that *connection point*, the *Metering Provider(s*) who has an agreement to service the *metering installation*, in which case access is to be restricted only to allow authorised work, the *Network Service Providers* associated with the connection point, *NEMMCO* and *NECA* and its authorised agents, and any *Customer* who is registered with *NEMMCO* and who purchases *electricity* at the associated *connection point*..		Decision based on clause 7.7(a)
2.10			Electronic access to *metering data* from a *metering installation* shall only be provided where passwords in accordance with clause 7.8.2 of the *Code* are allocated.	7.7(b)	
2.11			Access to *metering data* from the *metering installation*, by those who have rights of access, must be scheduled appropriately to ensure that congestion does not occur.	7.7(c)	
~~2.12~~		~~Performance~~	~~*Energy data* is required for all *trading intervals* (that is, 48 intervals per 24 hour period) with the accuracy requirements in accordance with clause 3.8.7, where the error is defined as follows:~~		~~Decision based on clause 7.11(aa)(1)~~
2.12		Performance	*Energy data* is required for all *trading intervals* (that is, 48 intervals per 24 hour period) with the accuracy requirements in accordance with clause 3.8.7, where the		Decision based on clause 7.11(aa)(1)

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			error is defined as follows: $\sum_{i=1}^{n}$ (Agreed *load* per device type as per Load Table)$_i$ x (Actual number of device type in sample geographical area)$_i$ - 1		
			$\sum_{i=1}^{n}$ (Agreed *load* per device type as per Load Table)$_i$ x (Number of device type in sample geographical area as per Inventory Table)$_i$ where i = device type		
2.13			*Energy data* (calculated) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) within the timeframe required for *settlements* as specified in procedures established by *NEMMCO*.		Decision based on clause 7.11(aa)(2)
~~2.14~~			~~*Energy data* (calculated) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) in accordance with performance standards established by *NEMMCO*.~~		~~Decision based on clause 7.11(aa)(3)~~
2.14			*Energy data* (calculated) is required by *NEMMCO* by *data stream* for all *trading intervals* (that is, 48 intervals per 24 hour period) in accordance with performance standards established by *NEMMCO*..		Decision based on clause 7.11(aa)(3)

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~2.15~~		~~Outages~~	~~If an outage or malfunction occurs to a *metering installation database*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such time as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).~~	~~7.11(b)~~	~~If an outage or malfunction occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.~~
2.15		Outages	If an outage or malfunction occurs to a *metering installation database*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such time as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	If an outage or malfunction occurs to a *metering installation database*, the disaster recovery guidelines (refer clause 4) are applicable.
~~2.16~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*.~~	~~7.11(bb)~~	
2.16			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *metering installation database*..	7.11(bb)	

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~3.1~~	~~*Communications link*~~	~~Location~~	~~(Comment provided for explanation only)~~	~~7.3.1(a)(3a), 7.2.5(bb)~~	~~The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*.~~
3.1	*Communications link*	Location	(Comment provided for explanation only)	7.3.1(a)(3a), 7.2.5(bb)	The electronic connection between the *metering installation database* and the *telecommunications network* boundary is classified as a *communications link*..
~~3.2~~		~~Modem~~	~~(Comment provided for explanation only)~~		~~A modem is used to connect the *metering installation* to the *telecommunications network*.~~
3.2		Modem	(Comment provided for explanation only)		A modem is used to connect the *metering installation* to the *telecommunications network*..

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~3.3~~		~~Remote acquisition of data~~	~~(Comment provided for explanation only)~~	~~7.3.5(b), 7.9.2(a)~~	~~*NEMMCO* is responsible for the remote acquisition of the *metering data* from the *metering installation*.~~
3.3		Remote acquisition of data	(Comment provided for explanation only)	7.3.5(b), 7.9.2(a)	*NEMMCO* is responsible for the remote acquis ition of the *metering data* from the *metering installation*..
3.4			Relevant *energy data* must be provided to *NEMMCO* or its agent should a failure of the remote acquisition facility occur, and such an arrangement has been made by *NEMMCO*.		Decision based on clause 7.9.2(b)
3.5			Access to the *metering installation database* from a *telecommunications network* must be provided to facilitate the remote acquisition of data.	7.2.5(bc), 7.12(aa)	
3.6			The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
3.7			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
~~3.8~~		~~Security~~	~~The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*.~~	~~7.8.1(a)~~	

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
3.8		Security	The *communication link* is to be secure and associated links, circuits and information storage and processing systems are to be secured by means of seals or other devices approved by *NEMMCO*..	7.8.1(a)	
3.9		Outages	If an outage or malfunction occurs to a *communications link*, repairs must be made as soon as practicable and in any event within 2 *days* of detection or such time as detection should have reasonably occurred, unless a written exemption is obtained from *NEMMCO* (as provided for in the exemption procedure published by *NEMMCO* in accordance with clause 7.11(ba) of the *Code*).	7.11(b)	
~~3.10~~			~~If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *communications link*.~~	~~7.11(bb)~~	
3.10			If an exemption is permitted by *NEMMCO* then *NEMMCO* must be provided with a plan for the rectification of the *communications link*..	7.11(bb)	
3.11	Testing	Testing by *NEMMCO*	*NEMMCO* must have unrestrained access to the *metering installation* for the purpose of testing the *metering installation* where *NEMMCO* agrees to comply with reasonable security and safety requirements and has first given at least two *business days'* notice of its intention to access the *metering installation* for the purpose of testing the *metering installation*. The notice must include the name of the *representative* who will be conducting the test on behalf of *NEMMCO*, and the *time* when the test will	7.6.1(d)	

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			commence and the expected *time* when the inspection will conclude.		
~~3.12~~		~~Actions in event of non-compliance~~	~~If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*.~~	~~7.6.2(a)~~	
3.12		Actions in event of non-compliance	If the accuracy of the *metering installation* does not comply with the requirements of the *Code*, *NEMMCO* must be advised as soon as practicable of the errors detected and the possible duration of the existence of errors, and arrangements made for the accuracy of the *metering installation* to be restored in a time frame agreed with *NEMMCO*..	7.6.2(a)	
3.13			If a *metering installation* test, inspection or audit demonstrates errors in excess of those permitted by the *Code* and the time at which that error arose is not known, the error is deemed to have occurred at a time half way between the time of the most recent test or inspection which demonstrated that the *metering installation*, or the meter family to which the *meter* of the *metering installation* belongs, complied with the relevant accuracy requirement and the time when the error was detected.		Decision based on clause 7.9.5(a)
3.14			If a test or audit of a *metering installation* demonstrates an error of measurement of less than 1.5		Decision based on clause

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
			times the error, no *substitution* of readings is required unless in *NEMMCO's* reasonable opinion a particular party would be significantly affected if no *substitution* were made.		7.9.5(b)
4.1	Management, maintenance and auditing	Installation and maintenance	Installation and maintenance of *metering installation*s must be carried out only by a *Metering Provider*, in accordance with this *metrology procedure*.	7.4.1(a), S7.4.1(f)	
4.2		*NMI*	An application is to be made to the *Local Network Service Provider* for a *NMI* for each *metering installation*.	7.3.1(d)	
4.3			The *NMI* must be registered with *NEMMCO* in accordance with procedures from time to time specified by *NEMMCO.*	7.3.1(db), 7.2.5(d)	
4.4		Security controls	The *energy data* held in the *metering installation* is to be protected from direct local or remote electronic access by suitable password and security controls.		Decision based on clause 7.8.2(a)
4.5			Records of electronic access passwords must be kept secure.	7.8.2(b)	
4.6			"Read-only" passwords must be allocated to *Market Participant*s, *Local Network Service Provider*s and *NEMMCO*, except where separate "read-only" and "write" passwords are not available, in which case a password must be allocated to *NEMMCO*, only.	7.8.2(c)	
4.7			The *Metering Provider* must hold "read-only" and "write" passwords.	7.8.2(d)	

Schedule 5 – Type 7 Metering Installation – Metering Data Services					
Ref.	**Components of a metering installation**	**Characteristics of a metering installation**	**Requirement**	**Clause in Code**	**Metrology Coordinator Decision/Comment**
~~4.8~~			~~A copy of the passwords must be forwarded to *NEMMCO*.~~	~~7.8.2(e)~~	
4.8			A copy of the passwords must be forwarded to *NEMMCO*..	7.8.2(e)	
4.9			*Metering data* and passwords are confidential data and are to be treated as *confidential information* subject to clause 7.7 of the *Code* which sets out rights of access to data.	7.10, 8.6.1	
5.1	*Metering Provider*		A *Metering Provider* must be accredited by and registered with *NEMMCO*, and only for the type of work the *Metering Provider* is qualified to provide.	S7.4.1(a)	
5.2			The *Metering Provider* must have the necessary licences in accordance with appropriate State requirements.	S7.4.1(d)	
5.3		Capabilities	*Metering Providers*, who wish to apply for categories of *Metering Provider* accreditation of *metering installation* type 7, must be able to exhibit, to the reasonable satisfaction of *NEMMCO* the capabilities listed in Schedule 16.	S7.4.4	

Schedule 6 - Metering Installation Type 5 – Validation and Substitution

1. Requirement to validate meter readings

Actual meter readings will be required to be validated in accordance with clause ~~3.3.1~~3.3.1 of this *Metrology Procedure*. The validation rules that may be applied to the *energy data* read from the *meter* of a type 5 *metering installation* are:

- *Consumption energy data* for the *meter* read period = sum of *interval energy data* for the *meter* read period;
- *Accumulated meter* read value is numeric and > 0;
- *Accumulated meter* read value is >= previous *accumulated meter* read value;
- *Accumulated meter* read value passes high/low test;
- *Meter* read date > previous *meter* read date;
- Maximum value (to ensure that no spikes are created);
- Null checks;
- Dial capacity and decimal point check; and
- Validation rules specified for type 5 *metering installations* in the validation and *substitution* procedures developed by *NEMMCO* under clause 7.9.4(b) of the *Code*.

2. Requirement to produce substituted energy data

In accordance with clause ~~3.3.2~~3.3..2 of this *Metrology Procedure*, *energy data* for a type 5 *metering installation* will be required to be *substituted* where:

(a) the *actual meter reading* fails the validation tests;

(b) there is a failure of the metering equipment; or

(c) an inspection or test on the metering equipment establishes that a measurement error exists.

3. Responsible Person Obligations

(a) Where the *Responsible Person* has engaged a *Metering Provider* in accordance with clause 1.2.3 of this *Metrology Procedure*, the *Responsible Person* must advise the *Metering Provider* the *substitution* type that is to be used.

(b) The *Responsible Person* may use *Substitution* Type 1 except where the first *actual meter reading* has not been undertaken.

(c) The *Responsible Person* may use *Substitution* Type 2 where *energy data* is to be *substituted* during the period no later than one (1) month following the *previous meter reading*, except where the first *actual meter reading* has not been undertaken.

(d) The *Responsible Person* may use *Substitution* Types 3, 4 and 5 in the circumstances described in clauses 4.3, 4.4 and 4.5 of this schedule 6, respectively.

(e) The *Responsible Person* may use *Substitution* Type 6 prior to the first *actual meter reading* being undertaken.

(f) The *Responsible Person* must notify affected *Market Participants* where *estimated energy data* is used via the status flag in the data file format.

(g) The *Responsible Person* must ensure that for all *Substitution* Types, except *Substitution* Type 4, *estimated energy data* is based on an *actual meter reading*, and is not based on *energy data* that has previously been *estimated* or *substituted*.

4. Substitution Types

The "approved techniques" for substituting *energy data* for type 5 *metering installations* are provided in this clause.

4.1 Substitution Type 1

The *Responsible Person* may *substitute* the *energy data* using the 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 determined from the table below.

Substitution Day	**"Nearest Equivalent *Day*" or "Like *Day*" (in order of availability)**
~~Monday~~	~~Monday❖❖ Monday❖~~
Monday	Monday❖❖ Monday❖
~~Tuesday~~	~~Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖~~
Tuesday	Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖
~~Wednesday~~	~~Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖~~
Wednesday	Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖
~~Thursday~~	~~Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖~~
Thursday	Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖
~~Friday~~	~~Friday❖❖ Friday❖~~
Friday	Friday❖❖ Friday❖
~~Saturday~~	~~Saturday❖❖ Saturday❖~~
Saturday	Saturday❖❖ Saturday❖
~~Sunday~~	~~Sunday❖❖ Sunday❖~~
Sunday	Sunday❖❖ Sunday❖

~~*Substitutions* for 'Like *Day*' to be as detailed above, unless:~~

- ~~No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.~~
- ~~The *substitution day* was a public holiday, in which case the most recent Sunday is to be used.~~
- ~~The *substitution day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *substitution* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.~~

❖❖ ~~Occurring in the same week as the *substitution day* in the previous year.~~

❖ ~~Occurring in the week preceding that in which the *substitution day* occurs in the previous year.~~

Substitutions for 'Like *Day*' to be as detailed above, unless:

- No readings are available on the first listed *day*, then the next listed

preferred *day* is to be used.

- ♦ The *substitution day* was a public holiday, in which case the most recent Sunday is to be used.
- ♦ The *substitution day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *substitution* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.

❖❖ Occurring in the same week as the *substitution day* in the previous year.

❖ Occurring in the week preceding that in which the *substitution day* occurs in the previous year.

4.2 Substitution Type 2

The *Responsible Person* may *substitute* the *energy data* using the data from the "Nearest Equivalent *Day*" or "Like *Day*" from the previous *meter* reading period. The "Nearest Equivalent *Day*" or "Like *Day*" is determined from the table below.

Substitution Day	**"Nearest Equivalent *Day*" or "Like *Day*" (in order of availability)**
~~Monday~~	~~Monday❖❖ Monday❖~~
Monday	Monday❖❖ Monday❖
~~Tuesday~~	~~Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖~~
Tuesday	Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖
~~Wednesday~~	~~Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖~~
Wednesday	Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖
~~Thursday~~	~~Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖~~
Thursday	Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖
~~Friday~~	~~Friday❖❖ Friday❖~~
Friday	Friday❖❖ Friday❖
~~Saturday~~	~~Saturday❖❖ Saturday❖~~
Saturday	Saturday❖❖ Saturday❖
~~Sunday~~	~~Sunday❖❖ Sunday❖~~
Sunday	Sunday❖❖ Sunday❖
~~*Substitutions* for 'Like *Day*' to be as detailed above, unless:~~ ~~♦ No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.~~ ~~♦ The *substitution day* was a public holiday, in which case the most recent Sunday is to be used.~~ ~~♦ The *substitution day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *substitution* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.~~ ~~❖❖ Occurring in the last whole week of the previous *meter* reading period.~~ ~~❖ Occurring in the week preceding the last whole week of the previous *meter* reading period~~	
Substitutions for 'Like *Day*' to be as detailed above, unless:	

- ♦ No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.
- ♦ The *substitution day* was a public holiday, in which case the most recent Sunday is to be used.
- ♦ The *substitution day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *substitution* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.

❖❖ Occurring in the last whole week of the previous *meter* reading period.

❖ Occurring in the week preceding the last whole week of the previous *meter* reading period

Alternatively, the *trading intervals* to be *substituted* may be *substituted* using an average of each interval from the preceding four (4) weeks, or part thereof. If *interval energy data* is required to be *substituted* for a public holiday, the most recent available Sunday is to be used.

4.3 Substitution Type 3

Previously used *substituted energy data* can be changed, prior to the *actual meter reading* or prior to the second revision in the *NEMMCO settlements timetable* (whichever occurs first), where the *Financially Responsible Market Participant*, *Local Retailer* and *Local Network Service Provider* have agreed, on the basis of site- or customer-specific information, that the original *substituted energy data* is in error and a correction is required.

4.4 Substitution Type 4

Where *substituted energy data* is to be created for periods up to, but not exceeding two (2) hours, it can be created using simple linear interpolation.

4.5 Substitution Type 5

(a) The *Financially Responsible Market Participant*, the *Local Retailer* and the *Local Network Service Provider* may agree to use another method of *substitution* (which may be a modification of an existing *Substitution* Type) where none of the existing *Substitution* Types is applicable.

(b) The specifics of this *Substitution* Type may involve a globally applied method or a site-specific method.

4.6 Substitution Type 6

Prior to the first *actual meter reading*, the *interval energy data* may be *substituted* using a method agreed between the *Financially Responsible Market Participant*, the *Local Retailer* and the *Local Network Service Provider*.

Schedule 7 - Metering Installation Type 5 - Estimation

1. Requirement to produce *estimated energy data*

Estimated energy data will be required for a type 5 *metering installation* in accordance with clause ~~3.4.1~~3..4.1 of this *Metrology Procedure*. *Energy data* may be *estimated*:

(a) on a weekly basis for the *billing period* where a *meter* reading has not occurred during that *billing period*; or

(b) for the balance of a *billing period* where a *meter* reading has occurred during that *billing period*; or

(c) to the next *scheduled meter reading* date.

2. Responsible Person Obligations

(a) Where the *Responsible Person* has engaged a *Metering Provider* in accordance with clause 1.2.3 of this *Metrology Procedure*, the *Responsible Person* must advise the *Metering Provider* the *estimation* type that is to be used.

(b) The *Responsible Person* may use *Estimation* Type 1 except where the first *actual meter reading* has not been undertaken.

(c) The *Responsible Person* may use *Estimation* Type 2 where *energy data* is to be *estimated* during the period no later than one (1) month following the *previous meter reading*, except where the first *actual meter reading* has not been undertaken.

(d) The *Responsible Person* may use *Estimation* Type 3 prior to the first *actual meter reading* being undertaken.

(e) The *Responsible Person* must notify affected *Market Participants* where *estimated energy data* is used via the status flag in the data file format.

(f) The *Responsible Person* must ensure that for all *Estimation* Types *estimated energy data* is based on an *actual meter reading*, and is not based on *energy data* that has previously been *estimated* or *substituted*.

~~3.~~ 3. Estimation Types

The "approved techniques" for estimating *energy data* for type 5 *metering installations* are provided in this clause.

3.1 Estimation Type 1

The *Responsible Person* may *estimate* the *energy data* for a *day*, or part thereof, using the data from the "Nearest Equivalent *Day*" or "Like *Day*" from the same *meter* reading period in the previous year. The "Nearest Equivalent *Day*" or "Like *Day*" is determined from the table below.

Estimation Day	**Nearest Equivalent *Day*" or "Like *Day*" (in order of availability)**
~~Monday~~	~~Monday❖ ❖ Monday❖~~
Monday	Monday❖❖ Monday❖
~~Tuesday~~	~~Tuesday❖ ❖ Wednesday❖ ❖ Tuesday❖ Wednesday❖~~
Tuesday	Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖
~~Wednesday~~	~~Wednesday❖ ❖ Tuesday❖ ❖ Thursday❖ ❖ Wednesday❖ Thursday❖ Tuesday❖~~
Wednesday	Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖
~~Thursday~~	~~Thursday❖ ❖ Wednesday❖ ❖ Tuesday❖ ❖ Thursday❖ Wednesday❖ Tuesday❖~~
Thursday	Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖
~~Friday~~	~~Friday❖ ❖ Friday❖~~
Friday	Friday❖❖ Friday❖
~~Saturday~~	~~Saturday❖ ❖ Saturday❖~~
Saturday	Saturday❖❖ Saturday❖
~~Sunday~~	~~Sunday❖ ❖ Sunday❖~~
Sunday	Sunday❖❖ Sunday❖

~~*Estimations* for 'Like *Day*' to be as detailed above, unless:~~

- ~~No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.~~
- ~~The *estimation day* was a public holiday, in which case the most recent Sunday is to be used.~~
- ~~The estimation *day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *estimation* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.~~

~~❖❖ Occurring in the same week as the estimation *day* in the previous year.~~

~~❖ Occurring in the week preceding that in which the estimation *day* occurs in the previous year.~~

Estimations for 'Like *Day*' to be as detailed above, unless:

- ♦ No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.
- ♦ The *estimation day* was a public holiday, in which case the most recent Sunday is to be used.
- ♦ The estimation *day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *estimation* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.

❖❖ Occurring in the same week as the estimation *day* in the previous year.

❖ Occurring in the week preceding that in which the estimation *day* occurs in the previous year.

3.2 Estimation Type 2

The *Responsible Person* may *estimate* the *energy data* for a *day*, or part thereof, using the data from the "Nearest Equivalent *Day*" or "Like *Day*" from the previous *meter* reading period. The "Nearest Equivalent *Day*" or "Like *Day*" is determined from the table below.

Estimation Day	**"Nearest Equivalent *Day*" or "Like *Day*" (in order of availability)**
~~Monday~~	~~Monday❖❖ Monday❖~~
Monday	Monday❖❖ Monday❖
~~Tuesday~~	~~Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖~~
Tuesday	Tuesday❖❖ Wednesday❖❖ Tuesday❖ Wednesday❖
~~Wednesday~~	~~Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖~~
Wednesday	Wednesday❖❖ Tuesday❖❖ Thursday❖❖ Wednesday❖ Thursday❖ Tuesday❖
~~Thursday~~	~~Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖~~
Thursday	Thursday❖❖ Wednesday❖❖ Tuesday❖❖ Thursday❖ Wednesday❖ Tuesday❖
~~Friday~~	~~Friday❖❖ Friday❖~~
Friday	Friday❖❖ Friday❖
~~Saturday~~	~~Saturday❖❖ Saturday❖~~
Saturday	Saturday❖❖ Saturday❖
~~Sunday~~	~~Sunday❖❖ Sunday❖~~
Sunday	Sunday❖❖ Sunday❖

~~*Estimations* for 'Like *Day*' to be as detailed above, unless:~~

- ~~No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.~~
- ~~The *estimation day* was a public holiday, in which case the most recent Sunday is to be used.~~
- ~~The *estimation day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *estimation* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.~~

~~❖❖ Occurring in the last whole week of the previous *meter* reading period.~~

~~❖ Occurring in the week preceding the last whole week of the previous *meter* reading period~~

Estimations for 'Like *Day*' to be as detailed above, unless:

- ♦ No readings are available on the first listed *day*, then the next listed preferred *day* is to be used.
- ♦ The *estimation day* was a public holiday, in which case the most recent Sunday is to be used.
- ♦ The *estimation day* was not a public holiday and the 'Like *Day*' is a public holiday, in which case the *estimation* 'Like *Day*' to be used must be the most recent *day* that is not a public holiday, Saturday or Sunday.

❖❖ Occurring in the last whole week of the previous *meter* reading period.

❖ Occurring in the week preceding the last whole week of the previous *meter* reading period

Alternatively, the *trading intervals* to be *estimated* may be *estimated* using an average of each *trading interval* from the preceding four (4) weeks, or part thereof. If *interval energy data* is required to be *estimated* for a public holiday, the most recent available Sunday is to be used.

3.3 Estimation Type 3

Prior to the first *actual meter reading*, the *interval energy data* may be *estimated* using a method agreed between the *Financially Responsible Market Participant*, the *Local Retailer* and the *Local Network Service Provider*.

Schedule 8 – Metering Installation Type 6 – Validation and Substitution

1. Requirement to validate meter readings

Actual meter readings will be required to be validated in accordance with clause ~~3.3.1~~3.3.1 of this *Metrology Procedure*. The validation rules that may be applied to the *energy data* read from the *meter* of a type 6 *metering installation* are:

- *Meter* read value is numeric and > 0;
- *Meter* read value is >= previous *meter* read value;
- *Meter* read value passes high/low test;
- *Meter* read date > previous *meter* read date;
- Null checks;
- Dial capacity and decimal point check; and
- Validation rules specified for type 6 *metering installations* in the validation and *substitution* procedures developed by *NEMMCO* under clause 7.9.4(b) of the *Code*.

2. Requirement to produce substituted energy data

In accordance with clause ~~3.3.2~~3.3.2 of this *Metrology Procedure, energy data* for a type 6 *metering installation* will be required to be *substituted* where:

(a) the *actual meter reading* fails the validation tests;

(b) there is a failure of the metering equipment;

(c) an inspection or test on the metering equipment establishes that a measurement error exists; or

(d) an *estimated read* is required in accordance with clause ~~3.2.9~~3.2.9 of this *Metrology Procedure* and is required to transfer a customer to a new *Retailer*..

3. Responsible Person Obligations

(a) Where the *Responsible Person* has engaged a *Metering Provider* in accordance with clause 1.2.3 of this *Metrology Procedure*, the *Responsible Person* must advise the *Metering Provider* the *substitution* type that is to be used.

(b) The *Responsible Person* may use *Substitution* Types 1, 2, 3 or 4, in accordance with clause 4 of this Schedule 8, when the *energy data* is required to be *substituted*.

(c) The *Responsible Person* must notify affected *Market Participants* where *substituted energy data* is used via the status flag in the data file format.

(d) The *Responsible Person* must ensure that for all *Substitution* Types, *substituted energy data* is based on an *actual meter reading*, and is not based on *energy data* that has previously been *estimated* or *substituted*.

4. Substitution Types

The "approved techniques" for substituting *energy data* for type 6 *metering installations* are provided in this clause.

4.1 Substitution Type 1

Substitution

= Average daily consumption from same *meter* read period last year

* Number of *days* required to be *substituted*

4.2 Substitution Type 2

Substitution

= Average daily consumption from previous *meter* read period

* Number of *days* required to be *substituted*

Note: Where the *scheduled meter reading* frequency is less frequent than monthly, *Substitution* Type 2 is to be used only when the consumption from the same *meter* read period last year is not available.

4.3 Substitution Type 3

Substitution

= Average daily consumption for this same customer class with the same type of usage

* Number of *days* required to be *substituted*

Notes:

1. *Substitution* Type 3 is to be used only when the consumption from the same *meter* read period last year and the consumption from the previous *meter* read period are not available.
2. Customer classes are Residential, Non-Residential, Farm and Public Lighting.
3. Types of usage are controlled and uncontrolled.

4.4 Substitution Type 4

(a) The *Financially Responsible Market Participant*, the *Local Retailer* and the *Local Network Service Provider* may agree to use another method of *substitution* (which may be a modification of an existing *Substitution* Type) where none of the existing *Substitution* Types is applicable.

(b) The specifics of this *Substitution* Type may involve a globally applied method or a site-specific method.

Schedule 9 - Metering Installation Type 6 - Estimation

1. Requirement to produce estimated energy data

Estimated energy data for a type 6 *metering installation* will be required in accordance with clauses ~~3.4.1~~3.4.1 of this *Metrology Procedure*. *Energy data* may be *estimated*:

(a) on a weekly basis for the *billing period* where a *meter* reading has not occurred during that *billing period*; or

(b) for the balance of a *billing period* where a *meter* reading has occurred during that *billing period*; or

(c) to the next *scheduled meter reading* date.

2. Responsible Person Obligations

(a) Where the *Responsible Person* has engaged a *Metering Provider* in accordance with clause 1.2.3 of this *Metrology Procedure*, the *Responsible Person* must advise the *Metering Provider* the *estimation* type that is to be used.

(b) The *Responsible Person* may use *Estimation* Types 1, 2 or 3, in accordance with the circumstances described in clause 3 of this schedule 9, respectively.

(c) The *Responsible Person* must notify affected *Market Participants* where *estimated energy data* is used via the status flag in the data file format.

(d) The *Responsible Person* must ensure that for all *Estimation* Types, *estimated energy data* is based on an *actual meter reading*, and is not based on *energy data* that has previously been *estimated* or *substituted*.

3. Estimation Types

The "approved techniques" for estimating *energy data* for type 6 *metering installations* are provided in this clause.

3.1 Estimation Type 1

Estimate

= Average daily consumption in same *meter* read period last year

* Number of *days* required to be *estimated*

3.2 Estimation Type 2

Estimate

= Average daily consumption in previous *meter* read period

* Number of *days* required to be *estimated*

Note: Where the *scheduled meter reading* frequency is less frequent than monthly, *Estimation* Type 2 is to be used only when the consumption from the same *meter* read period last year is not available.

3.3 Estimation Type 3

Estimate

= *Average Daily Load*

* Number of *days* required to be *estimated*

Note: *Estimation* Type 3 is to be used only when the consumption from the same *meter* read period last year and the consumption from the previous *meter* read period are not available.

Schedule 10 – Metering Installation Type 6 – Load Profiling

1. Requirement for load profiling

The use of *load* profiling is required in order to determine *trading interval* data, for wholesale market *settlement* purposes, for type 6 *metering installations*.

Load profiling involves:

- determining an *estimate* of the average load profile for *first tier* and *second tier controlled loads* for a *profile area* over a given period of time (*Profile Preparation Service – Controlled Load Profile*);
- allocating that profile to both *first tier* and *second tier controlled loads energy data* (*Basic Meter Profiler – Controlled Load Profile*);
- determining an *estimate* of the average load profile of the remaining *first tier* and *second tier loads* for a *profile area* (that is, excluding the *first tier* and *second tier controlled loads*) over a given period of time (*Profile Preparation Service – Net System Load Profile*); and
- allocating that load profile to *second tier non-controlled loads* in that *profile area* (*Basic Meter Profiler – Net System Load Profile*).

2. Controlled Load Profile

2.1 Profile Preparation Service

In accordance with clause ~~3.10.2~~3.10.2 of this *Metrology Procedure*,~~a single~~ *Controlled Load Profile(s) (CLP)*~~for all controlled loads~~ for each *profile area* must be estimated by *NEMMCO* using *interval energy data* from a sample (or samples) of *controlled load interval meters*.

The sample *meter*s, which will be installed by the NSW *LNSPs*, must be a type 5 *metering installation*. Two *NMIs* may need to be allocated to each sample *meter*.

- one *NMI* must be used for the *interval energy data* from the sample *meter* that is used to estimate the ~~*Controlled Load Profile*~~*CLP* in accordance with this clause 2.1; and

- ~~where the *metering installation* that has a sample *meter* is second tier and is to be settled on the basis of *interval energy data*, then *interval energy data* must be transferred to *NEMMCO* as a second *data stream* of that *NMI* in accordance with Schedule 3 of this *Metrology Procedure*, for the purposes of settlement;~~
- ~~where the *metering installation* that has a sample *meter* is first tier, or is second tier and is settled on the basis of *consumption energy data*, then~~ a second *NMI* must be used to transfer the *consumption energy data* to which the ~~*Controlled Load Profile*~~*CLP* is applied in accordance with clause 2.2 of this Schedule 10.

2.1.1 One Controlled Load Profile

(a) There shall be at least one *CLP in each profile area*. An *LNSP* may choose to introduce a second *CLP* in its profile area.

(b) If the *LNSP* chooses not to introduce a second *CLP*, one (1) *CLP* must be calculated for all controlled loads in a profile area, which is based on a sample of controlled load interval meters.

(c) For each half hourly *trading* interval, the ~~*Controlled Load Profile*~~*CLP* must be calculated by *profile area* as follows:

CLP for a *profile area* for a *trading interval j*

$$= \sum_{n=1}^{N} (\text{sample } \textit{meter} \text{ load in } \textit{trading interval } j)_n * (\text{weighting factor})_n$$

where:

n represents the set of sample *NMI*'s in the *profile* area

Weighting factor is the weighting factor associated with the *NMI*

2.1.2 Two Controlled Load Profiles

(a) If the *LNSP* chooses to introduce a second *CLP*, it must provide a written notice advising of the commencement date of the second *CLP* to:

- the Metrology Coordinator
- NEMMCO and
- all Retailers.

(b) The commencement date must be at least six (6) months after the date of the notice.

(c) From the commencement date, two (2) *CLPs* must be calculated for the *profile area*:

- one for *controlled loads* in the *profile area* based on a sample of *controlled load interval meters* on the controlled load 1 network tariff; and
- one for *controlled loads* in the *profile area* based on a sample of *controlled load interval meters* on the controlled load 2 network tariff.

For each half hourly *trading interval*, the *Controlled Load Profiles* must be calculated by *profile area* as follows:

***CLP* for loads on the controlled load 1 network tariff**

CLP_1 for a *profile area* for a *trading interval j*

$$= \sum_{n=1}^{N} \text{(load for sample } \textit{meter} \text{ on the controlled load 1 network tariff in } \textit{trading interval} \text{ j)}_n$$

$$* \text{ (weighting factor)}_n$$

where:

n represents the set of sample *NMI*'s on the controlled load 1 network tariff, in the *profile* area

Weighting factor is the weighting factor associated with the *NMI*

***CLP* for loads on the controlled load 2 network tariff**

CLP_2 for a *profile area* for a *trading interval j*

$$= \sum_{m=1}^{M} \text{(load for sample } \textit{meter} \text{ on the controlled load 2 network tariff in } \textit{trading interval} \text{ j)}_m$$

$$* \text{ (weighting factor)}_m$$

where:

m represents the set of sample *NMI*'s on the controlled load 2 network tariff, in the *profile* area

Weighting factor is the weighting factor associated with the *NMI*

2.2. Basic Meter Profiler – Controlled Load

In accordance with clause ~~3.10.1~~3.10.1 of this *Metrology Procedure*, *NEMMCO* must apply the appropriate *CLP*, for the *profile area* to which the *NMI* is *connected*, to the *consumption energy data* for all *first tier* and *second tier controlled loads*, in order to obtain *trading interval energy data.*

2.2.1 One controlled load profile

~~The~~For *NMIs* in a *profile area* with one *CLP*, the *CLP* must be applied as follows:

~~Half hourly *energy data* for *trading interval j* for a *NMI data*~~

~~*stream*~~

~~= *Consumption energy data* between start date and end date *~~ $\frac{CLP_j}{\sum_{i=startdate}^{end\ date} CLP_i}$

~~where~~

~~CLP_j = the~~

~~calculated *Controlled Load Profile energy* for *trading interval*~~

~~j~~ $\sum_{i=startdate}^{end\ date} CLP_i$ ~~= the~~

~~sum of *Controlled Load Profile energy* between the start date and the end date~~

~~if the *consumption energy data* is an *actual meter reading*~~

~~start date = 00:00 on the *day* after the previous *meter* reading~~

~~end date = 23:59 on the current *meter* reading date~~

~~and where if the *consumption energy data* is an *estimate*~~

~~start date = 00:00 on the first *day* of the *billing period*, or 00:00 on the previous *meter* reading date, or 00:00 on the first *day* that the *load* becomes *second tier*, whichever is the later~~

~~end date = 23:59 on the last *day* of the *billing period*~~

Half hourly *energy data* for *trading interval j* for a *NMI data stream*

= *Consumption energy data* between start date and end date * $\frac{CLP_j}{\sum_{i=startdate}^{end\ date} CLP_i}$

where:

CLP_j = the calculated *Controlled Load Profile energy* for *trading interval j*;

$\sum_{i=startdate}^{end\ date} CLP_i$ = the sum of *Controlled Load Profile energy* between the start date and the end date; and

'start date' and 'end date' have the meanings given in clause 4 of this Schedule 10.

2.2.2 Two controlled load profiles

In a *profile area* where the LNSP has chosen to introduce a second *CLP*, the *CLPs* shall be applied as follows:

(a) *Loads* on the controlled load 1 network tariff (CLP_1) must be applied to the *consumption energy data* for all *first tier* and *second tier controlled loads*, which are on the controlled load 1 network tariff:

Half hourly *energy data* for *trading interval j* for a *NMI data stream* on the controlled load 1 network tariff

= *Consumption energy data* between start date and end date * $\frac{CLP_{1j}}{\sum_{i=startdate}^{end\ date} CLP_{1i}}$

where:

CLP_{1j} = the calculated *CLP_1 energy* for *trading interval j*

$\sum_{i=start\ date}^{end\ date} CLP_{1i}$ = the sum of the *CLP_1 energy* between the start date and the end date; and

'start date' and 'end date' have the meanings given in clause 4 of this Schedule 10.

(b) *Loads* on the controlled load 2 network tariff (CLP_2) must be applied to the *consumption energy data* for all *first tier* and *second tier controlled loads,* which are on the controlled load 2 network tariff:

Half hourly *energy data* for *trading interval j* for a *NMI data stream* on the controlled load 2 network tariff

= *Consumption energy data* between start date and end date * $\frac{CLP_{2j}}{\sum_{i=startdate}^{end\ date} CLP_{2i}}$

where:

CLP_{2j} = the calculated *CLP_2 energy* for *trading interval j*

$\sum_{i=start\ date}^{end\ date} CLP_{2i}$ = the sum of the *CLP_2 energy* between the start date and the end date; and

'start date' and 'end date' have the meanings given in clause 4 of this Schedule 10.

The resulting half hourly *energy data* produced by applying the *Controlled Load Profile* is at the *NMI data stream* level. The total of these *data streams* is used in the calculation of the *Net System Load Profile* as explained in clause 3.1 of this Schedule 10.

3. Net System Load Profile

3.1 Profile Preparation Service – Net System Load Profile

In accordance with clause ~~3.10.1~~3.10.1 of this *Metrology Procedure*, the form of profiling that *NEMMCO* must use for the *metering installations* to which this *Metrology Procedure*

applies, excluding *metering installations* for *controlled loads*, is the *Net System Load Profile* (*NSLP*).

The *NSLP* must be calculated by *profile area* as follows:

NSLP for a *profile area* for a *trading interval*

~~=~~ $\sum_{i=1}^{j}$ (*Energy* inflows to *profile area* at the *TNI* level)$_i$ * MLF$_i$

~~+~~ $\sum_{m=1}^{n}$ (*Energy* generated within *profile area* from embedded generation) $_m$ * MLF$_m$ * DLF $_m$

~~–~~ $\sum_{s=1}^{t}$ (Half hourly *load* in *profile area*) $_s$ * MLF$_s$ * DLF$_s$

~~**where**~~

~~MLF = Marginal Loss Factor applicable for the *NMI* that is stored in *MSATS*~~

~~DLF = Distribution~~**where:**

MLF = Marginal Loss Factor applicable for the *NMI* that is stored in *MSATS*

DLF = Distribution Loss Factor applicable for the *NMI* that is stored in *MSATS*

~~*i* = Each~~*i* = Each *TNI* with *energy* inflows to *profile area*

~~*m* = Each~~*m* = Each embedded generator with *energy* generated within *profile area*

~~s = Half~~s = Half hourly *loads* in *profile* area, which include:

- *interval metered second tier loads* ,
- *interval metered first tier loads*,
- unmetered *first tier and second tier loads*,
- *interval metered market loads* that are not *first tier* or *second tier loads, and*
- *interval energy data* for *first tier* and *second tier controlled loads* (calculated as set out in clause 2 of this Schedule 10),
- but exclude *interval metered loads* which are~~*slave metering installations or children*~~ in an *embedded network*.

3.2 Basic Meter Profiler – Net System Load Profile

In accordance with clause ~~3.10.1~~3.10.1 of this *Metrology Procedure*, *NEMMCO* must apply the *NSLP*, for the *profile area* to which the *NMI* is *connected*, to the *consumption energy data* for type 6 *metering installations*, excluding *metering installations* for *controlled loads*, in order to obtain *interval energy data.*

The profile must be applied as follows:

~~Half hourly *energy data* for *trading interval j* for a *NMI data stream*~~

~~= *Consumption energy data* between start date and end date *~~ $\frac{NSLP_j}{\sum_{i=startdate}^{end\,date} NSLP_i}$

~~where~~

~~$NSLP_j$ = the~~

~~calculated *NSLP energy* for *trading interval j*~~

~~$\sum_{i=start\,date}^{end\,date} NSLP_i$ = the~~

~~sum of *NSLP energy* between the start date and the end date~~

~~if the *consumption energy data* is an *actual meter reading*~~

~~start date = 00:00 on the *day* after the previous *meter* reading~~

~~end date = 23:59 on the current *meter* reading date~~

~~and where if the *consumption energy data* is an *estimate*~~

~~start date = 00:00 on the first *day* of the *billing period*, or 00:00 on the previous *meter* reading date, or 00:00 on the first *day* that the *load* becomes *second tier*, whichever is the later~~

~~end date = 23:59 on the last *day* of the *billing period*~~

Half hourly *energy data* for *trading interval j* for a *NMI data stream*

= *Consumption energy data* between start date and end date * $\frac{NSLP_j}{\sum_{i=startdate}^{end\,date} NSLP_i}$

where:

$NSLP_j$ = the calculated *NSLP energy* for *trading interval j*;

$\sum_{i=start\,date}^{end\,date} NSLP_i$ = the sum of *NSLP energy* between the start date and the end date; and

'start date' and 'end date' have the meanings given in clause 4 of this Schedule 10.

The resulting half hourly *energy data* produced by applying the *NSLP* is at the *NMI data stream* level.

4. Start Dates and End Dates

4.1 Pre 1 July 2003

Subject to clause 4.3 of this Schedule 10, prior to 1 July 2003:

(a) if the *consumption energy data* is an *actual meter reading*:

(i) the start date is 00.00 on the day after the previous *meter* reading; and

(ii) the end date is 23.59 on the current *meter* reading date; and

(b) if the *consumption energy data* is an estimate:

(i) the start date is the latest of:

(A) 00.00 on the first *day* of the *billing period*;

(B) 00.00 on the previous *meter* reading date; and

(C) 00.00 on the first *day* on which the *load* becomes *second tier*; and

(ii) the end date is 23.59 on the last *day* of the *billing period*.

4.2 Post 1 July 2003

Subject to clause 4.3 of this Schedule 10, with effect from 1 July 2003:

(a) if the *consumption energy data* is an *actual meter reading*:

(i) the start date is 00.00 on the day of the previous *meter* reading; and

(ii) the end date is the end of the *trading interval* commencing at 23.30 on the *day* prior to the current *meter* reading date; and

(b) if the *consumption energy data* is an estimate:

(i) the start date is the later of:

(A) 00.00 on the first *day* of the *billing period*;

(B) 00.00 on the previous *meter* reading date (whether actual or estimate; and

(C) 00.00 on the first *day* on which the *load* becomes *second tier*:

(ii) the end date is the earlier of:

(A) the end of the *trading interval* commencing at 23.30 on the last *day* of the *billing period*; and

(B) the end of the *trading interval* commencing at 23.30 on the estimate *meter* reading date.

4.3 Transitional

(a) In respect of each relevant *metering installation*, the transitional period is the period in respect of which the 'start date' occurs before 1 July 2003 and the 'end date' occurs on or after 1 July 2003.

(b) For the purposes of the transitional period for each relevant *metering installation:*

(i) the start date will be as defined in clause 4.1 of this Schedule 10; and

(ii) the end date will be as defined in clause 4.2 of this Schedule 10.

Schedule 11 – Metering Installation Type 7 – Energy Calculation

1. Requirement to produce energy data

1.1 Agreed market loads

(a) In accordance with clause ~~3.5~~3.5 of this *Metrology Procedure*, half-hourly *trading interval* data is required to be calculated by *NMI data stream* for those *market loads*, agreed between the *Metrology Coordinator* and *NEMMCO*, which do not require a *meter* to measure the flow of electricity in a power conductor.

(b) If the cost of installing, testing and maintaining new metering equipment to measure and record the amount of electricity *supplied* to an electrical installation for a *second tier load* is likely, in the reasonable opinion of the *Responsible Person*, to exceed the amount paid for the *supply* and sale of electricity, the *Responsible Person* may lodge a request to the *Metrology Coordinator* for this *market load* to be classified as either a "controlled unmetered *load"* (for which the *market load* is controlled) or "other unmetered *load"* (for which the *market load* is not controlled).

(c) The *Responsible Person* will be advised within 20 *business days* from the date of lodgement of such a request whether the *market load* has been agreed to be classified as either a "controlled unmetered *load"* or "other unmetered *load"* by the *Metrology Coordinator* and *NEMMC*O. If the *Responsible Person* is not advised whether the *market load* has been agreed or not agreed within 20 *business days*, the *load* is taken as not agreed to be classified as a type 7 *metering installation*.

(d) The *Metrology Coordinator* will publish the list of agreed *market loads* and any amendments to the list of agreed *market loads*.

1.2 Application to device types

The agreed *market load* that is published by the *Metrology Coordinator* will be generic in nature (for example, street lighting). For each agreed market *load* there may be one or more device types which are listed in the Load Table developed in accordance with clause 2.2 or clause 3.2 of this Schedule 11.

1.3 Application of NMI

(a) *Energy data* for an unmetered *load* is calculated by *NMI data stream*. A *NMI* is assigned for each unique combination of:

- *Financially Responsible Market Participant*,
- End-use customer,
- *LNSP*,
- *TNI*, and
- Distribution loss factor.

The *NMI* may contain different agreed *market loads* and/or different device types, but they must have the same *Financially Responsible Market Participant*, end-use customer, *LNSP*, *TNI* and Distribution loss factor.

(b) Where permitted by the *Code* or guidelines issued by *NEMMCO*, an unmetered *load* may be included in the *NMI* for a related metered *load*, where the number of devices

is small, for example watchman lights, the energy consumption of those devices is immaterial relative to the total energy consumption for that *NMI*, and the *Financially Responsible Market Participant*, end-use customer, *LNSP*, *TNI*, and Distribution loss factor are the same..

2. Controlled unmetered loads

This clause 2 is applicable to all agreed "controlled unmetered *loads*"..

2.2 Energy calculation

The *Responsible Person* must ensure that the *interval energy data* for "controlled unmetered *loads*", which have been classified as a type 7 *metering installation*, is calculated in accordance with the following algorithm.

Half-hourly *energy data* for *trading interval* j for a *NMI* (in watt hours) $= \sum_{i=1}^{n}$ {*k* * Device wattage$_i$ (in watts)* Device count for *NMI*$_i$ * Period *load* is switched on $_j$ * (*Trading interval* (in minutes) / 60)} ~~where~~ ~~*i = device type*~~ ~~*j = trading interval*~~ ~~*k = proportion of device attributable to that NMI*~~ ~~Device wattage is determined from the Load Table.~~ ~~Device count is determined from the Inventory Table.~~ ~~Period *load* is switched on is determined from the On/Off Table.~~
where *i* = device type *j = trading interval* *k* = proportion of device attributable to that *NMI* Device wattage is determined from the Load Table. Device count is determined from the Inventory Table.. Period *load* is switched on is determined from the On/Off Table.

2.2 Load Table

(a) The Load Table shows the device *load* (in watts) for use in calculating *interval energy data* for each device type. The *load* per device type must be the wattage of the device and associated control gear. There must be one Load Table that is used by all the relevant *Responsible Persons*.

(b) The *Responsible Persons* in New South Wales must develop jointly the initial Load Table. The initial Load Table must be agreed by the affected *Code Participants* and

the relevant end-use customer and approved and published by the *Metrology Coordinator*.

(c) The *Responsible Person* must ensure that any new device types are included in the Load Table prior to installation of the device. Changes to the Load Table must be agreed by the affected *Code Participants*, the relevant end-use customer and approved and published by the *Metrology Coordinator*.

(d) Where the device *load* is not agreed by the affected *Code Participants* and the relevant end-use customer, the device *load* should be derived from measurement tests conducted by a *NATA* accredited laboratory or overseas equivalent.

2.3 Inventory Table

(a) For each ~~*NMI,*~~*Responsible Person*, a separate Inventory Table is required that identifies, for each *NMI* for which it is responsible, each device type which forms part of the~~*NMI*~~ *load* and for each device type lists:

- The device type;
- The form of on/off control – photoelectric cell control, timer or ripple control or other control;
- If timer or ripple control, the on/off times for that timer or ripple injection system;
- If other control, the on/off times;
- If a device is shared with another *NMI*, the proportion of *load* that is agreed by affected *Code Participants* to be attributable to that *NMI* (*k*). Each *k* factor will be less than 1. The sum of the *k* factors for a shared device across each respective *NMI* is equal to 1;
- Number of such devices installed;
- Effective start date – the first *day* on which that record in the Inventory Table is to be included in the calculation of *energy data* for that *NMI*;
- Effective end date - the last *day* on which that record in the Inventory Table is to be included in the calculation of *energy data* for that *NMI*; and
- Last change date – the date that record in the Inventory Table was most recently created or modified.

(b) 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 device(s) must be included in the Inventory Table as a separate device type.

(c) Each *Responsible Person* must develop the initial Inventory Table for the *NMIs* for which it is responsible. The initial Inventory Table must be agreed by the affected *Code Participants*, the *Metrology Coordinator* and the relevant end-use customer.

(d) Each *Responsible Person* must use its *reasonable endeavours* to update the Inventory Table~~,~~ for the *NMIs* for which it is responsible, on ~~a timely~~at least a monthly basis for any additions, deletions and modifications to ensure that the accuracy requirements in clause 3.8.7 of this *Metrology Procedure* are met. Such ~~modifications.~~ additions, deletions or modifications to the Inventory Table may only be made on a retrospective basis where:

(a) agreed by the *Responsible Person* and the affected *Code Participants*; or

(b) where necessary to comply with clause 7.9.5 of the *Code*..

The *Responsible Person* must communicate any material changes to the Inventory Table to the affected *Code Participants* and the relevant end-use customer.

(e) The *Responsible Person* must provide the Inventory Table to *Code Participants* and the relevant end-use customer when requested.

2.4 On/Off Table

The form of on/off control may be:

- Photoelectric cell control;
- Timer or ripple control; or
- Other control.

2.4.1 Photoelectric cell control

(a) If the on/off times for a device is controlled by a photoelectric cell, then

- On time = sunset
- Off time = sunrise

(b) The *Responsible Person* must ensure that the appropriate sunset and sunrise times are obtained from the Australian Surveying and Land Information Group Web site ~~(www.auslig.gov.au/geodesy/astro/sunrise.htm),~~(www.auslig.gov.au/geodesy/astro/sunrise.htm), based on the longitude and latitude for the *TNI* as agreed between the *Responsible Person* and the *Metrology Coordinator*, and Australian Eastern Standard Time.

(c) The agreed longitude and latitude for each *TNI* or *LNSP*, where the same latitude and longitude is applicable for all *TNIs* within an *LNSP* area, shall be published by the *Metrology Coordinator*.

(d) The *Responsible Person* must ensure that the period that the *load* is switched on during a *trading interval* is calculated as follows:

Trading interval	***Period load is switched on***
For the *trading intervals* commencing after sunset and finishing prior to sunrise	Period *load* is switched on = 1
For the *trading intervals* commencing after sunrise and finishing prior to sunset	Period *load* is switched on = 0
For the *trading interval* during which the sunset occurs	Period *load* is switched on = (End time of *trading interval* – Time of sunset) / 30
For the *trading interval* during which the sunrise occurs	Period *load* is switched on = (Time of sunrise – Start time of *trading interval*) / 30

(e) Should testing on the operation of photoelectric cells by an independent party, agreed to by the *Responsible Person*, *Metrology Coordinator* and relevant end-use customer, indicate that the on/off times for a device controlled by a photoelectric cell are influenced materially and consistently by other variables (such as cloud cover), then the *Metrology Coordinator* shall revise the *Metrology Procedure* accordingly.

2.4.2 Timer or ripple control

(a) If the on/off times for a device is controlled by a timer or ripple injection system, then

- On time = ON time set on timer or ripple injection system

- Off time = OFF time set on timer or ripple injection system

(b) The *Responsible Person* must ensure that the period that the *load* is switched on during a *trading interval* is calculated as follows:

Trading interval	***Period load is switched on***
For the *trading intervals* commencing after on time and finishing prior to off time	Period *load* is switched on = 1
For the *trading intervals* commencing after off time and finishing prior to on time	Period *load* is switched on = 0
For the *trading interval* during which the on time occurs	Period *load* is switched on = (End time of *trading interval* – On time) / 30
For the *trading interval* during which the off time occurs	Period *load* is switched on = (Off time – Start time of *trading interval*) / 30

2.4.3 Other control

(a) Where the on/off times for a device are not in accordance with clause 2.4.1 or 2.4.2 of this Schedule 11, then the following alternative forms of control may be used:

- On time = sunrise or sunset or ON time set on timer or ripple injection system
- Off time = sunset or sunrise or OFF time set on timer or ripple injection system or a fixed duration after ON time.

Where sunrise or sunset is used, the actual time is determined in accordance with clause 2.4.1 of this Schedule 11.

(b) The *Responsible Person* must ensure that the period that the *load* is switched on during a *trading interval* is calculated as follows:

Trading interval	***Period load is switched on***
For the *trading intervals* commencing after on time and finishing prior to off time	Period *load* is switched on = 1
For the *trading intervals* commencing after off time and finishing prior to on time	Period *load* is switched on = 0
For the *trading interval* during which the on time occurs	Period *load* is switched on = (End time of *trading interval* – On time) / 30
For the *trading interval* during which	Period *load* is switched on =

the off time occurs	(Off time – Start time of *trading interval*) / 30

3. Other unmetered loads

This clause 3 is applicable to all agreed "other unmetered *load*s". "Other unmetered *load*s" do not have a controlled *load* and therefore the *energy* is calculated based on an annual *energy* consumption determined by agreement, refer clause 3.2 of this Schedule 11.

3.1 Energy calculation

The *Responsible Person* must ensure that the *interval energy data* for "other unmetered *load*s", which have been classified as a type 7 *metering installation*, is calculated in accordance with the following algorithm.

Half-hourly *energy data* for *trading interval j* for a *NMI* (in watt hours)

$$= \sum_{i=1}^{n} \{k * \text{Calculated device wattage}_i \text{ (in watts)} * \text{Device count for } NMI_i * \text{Period } load \text{ is switched on}_j * (\text{Trading interval (in minutes)} / 60)\}$$

where

i = device type

j = *trading interval*

k = proportion of device attributable to that *NMI*

Device wattage is determined from the Load Table.

Device count is determined from the Inventory Table.

Period *load* is switched on is determined from the On/Off Table.

3.2 Load Table

(a) The Load Table shows the annual *energy* consumption for that device which has been agreed between the *Responsible Person*, affected *Code Participants* and the relevant end-use customer. The annual *energy* consumption is used to calculate the calculated device wattage (in watts) which is used to calculate the *interval energy data* for each device type.

Calculated device wattage$_i$ = Agreed device annual *energy* consumption$_i$ / (365 * 24)

(b) Each *Responsible Persons* must develop a Load Table. The initial Load Table must be agreed by the affected *Code Participants* and the relevant end-use customer, and approved and published by the *Metrology Coordinator*.

(c) The *Responsible Person* must ensure that any new device types are included in the Load Table prior to installation of the device. Changes to the Load Table must be agreed by the affected *Code Participants* and the relevant end-use customer, and approved and published by the *Metrology Coordinator*.

3.3 Inventory Table

(a) For each ~~*NMI*~~*Responsible Person* a separate Inventory Table is required that identifies, for each *NMI* for which it is responsible, each device type which forms part of the~~*NMI*~~ *load* and for each device type lists:

- The device type;
- The form of on/off control (24 hours per *day*);
- If a device is shared with another *NMI*, the proportion of *load* that is agreed by affected *Code Participants* to be attributable to that *NMI* (*k*). Each *k* factor will be less than 1. The sum of the *k* factors for a shared device across each respective *NMI* is equal to 1;
- Number of such devices installed;
- Effective start date – the first *day* on which that record in the Inventory Table is to be included in the calculation of *energy data* for that *NMI*;
- Effective end date - the last *day* on which that record in the Inventory Table is to be included in the calculation of *energy data* for that *NMI*; and
- Last change date – the date that record in the Inventory Table was most recently created or modified.

(b) 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 device(s) shall be included in the Inventory Table as a separate device type.

(c) Each *Responsible Person* must develop the initial Inventory Table for the *NMIs* for which it is responsible. The initial Inventory Table must be agreed by the affected *Code Participants* and the relevant end-use customer.

(d) Each *Responsible Person* must use its *reasonable endeavours* to update the Inventory Table~~,~~ for the *NMIs* for which it is responsible, on ~~a timely~~at least a monthly basis for any additions, deletions and modifications to ensure that the accuracy requirements in clause 3.8.7 of this *Metrology Procedure* are met. Such ~~modifications.~~ additions, deletions or modifications to the Inventory Table may only be made on a retrospective basis where:

(i) agreed by the *Responsible Person* and the affected *Code Participants*; or

(ii) where necessary to comply with clause 7.9.5 of the *Code*..

The *Responsible Person* must communicate any material changes to the Inventory Table to the affected *Code Participants* and the relevant end-use customer.

(e) The *Responsible Person* must provide the Inventory Table to *Code Participants* and the relevant end-use customer when requested.

3.4 On/off Table

Other unmetered *load*s are assumed to operate 24 hours per *day*. For each *trading interval*, then

Period *load* is switched on = 1.

Schedule 12 – Metering Installation Type 7 – Validation and Substitution

1. Requirement to validate energy data calculations

Energy data calculations will be required to be validated in accordance with clause ~~3.5.2~~3.5.2 of this *Metrology Procedure*.. The validation rules that may be applied to the *energy data* calculated for a type 7 *metering installation* are:

- *Energy data* value is numeric and > 0;
- *Energy data* value passes high/low test;
- *Energy data* date > previous *energy data* date; and
- Validation rules specified for type 7 *metering installations* in the validation and *substitution* procedure developed by *NEMMCO* under clause 7.9.4(b) of the *Code*..

2. Requirement to produce substituted energy data

In accordance with clause ~~3.5.3~~3.5.3 of this *Metrology Procedure, energy data* for a type 7 *metering installation* will be required to be *substituted* where the *energy data* calculation fails the validation tests.

3. Responsible Person Obligations

(a) Where the *Responsible Person* has engaged a *Metering Provider* in accordance with clause 1.2.3 of this *Metrology Procedure*, the *Responsible Person* must advise the *Metering Provider* the *substitution* type that is to be used.

(b) The *Responsible Person* may use any of *Substitution* Types 1, 2, 3 or 4, in accordance with clause 4 of this schedule 12, when the *energy data* is required to be *substituted*..

(c) The *Responsible Person* must notify affected *Market Participants* where *substituted energy data* is used via the status flag in the data file format.

(d) The *Responsible Person* must ensure that for all *Substitution* Types, *substituted energy data* is based on calculated *energy data*, and is not based on *energy data* that has previously been *estimated* or *substituted*..

4. Substitution Types

The "approved techniques" for substituting *energy data* for type 7 *metering installations* are provided in this clause.

4.1 Substitution Type 1

The *energy data* is *substituted* with the *energy data* obtained by a recalculation based on the current Inventory Tables, Load Tables and On/Off Tables.

4.2 Substitution Type 2

Where the error in the calculation of the *energy data* is due to errors in the Inventory Table, Load Table or On/Off Table, the *energy data substituted* with the *energy data* obtained by a recalculation based on the most recent Inventory Tables, Load Tables and On/Off Tables for which there was no error.

4.3 Substitution Type 3

Where the error in the calculation of the *energy data* is due to an error in the algorithm, the *energy data* is *substituted* with the most recent *energy data* for which there was no error.

4.4 Substitution Type 4

(a) This *Financially Responsible Market Participant*, the *Local Retailer* and the *Local Network Service Provider* may agree to use another method of *substitution* (which may be a modification of an existing *Substitution* Type) where none of the existing *Substitution* Types is applicable.

(b) The specifics of this *Substitution* Type may involve a globally applied method or a site-specific method.

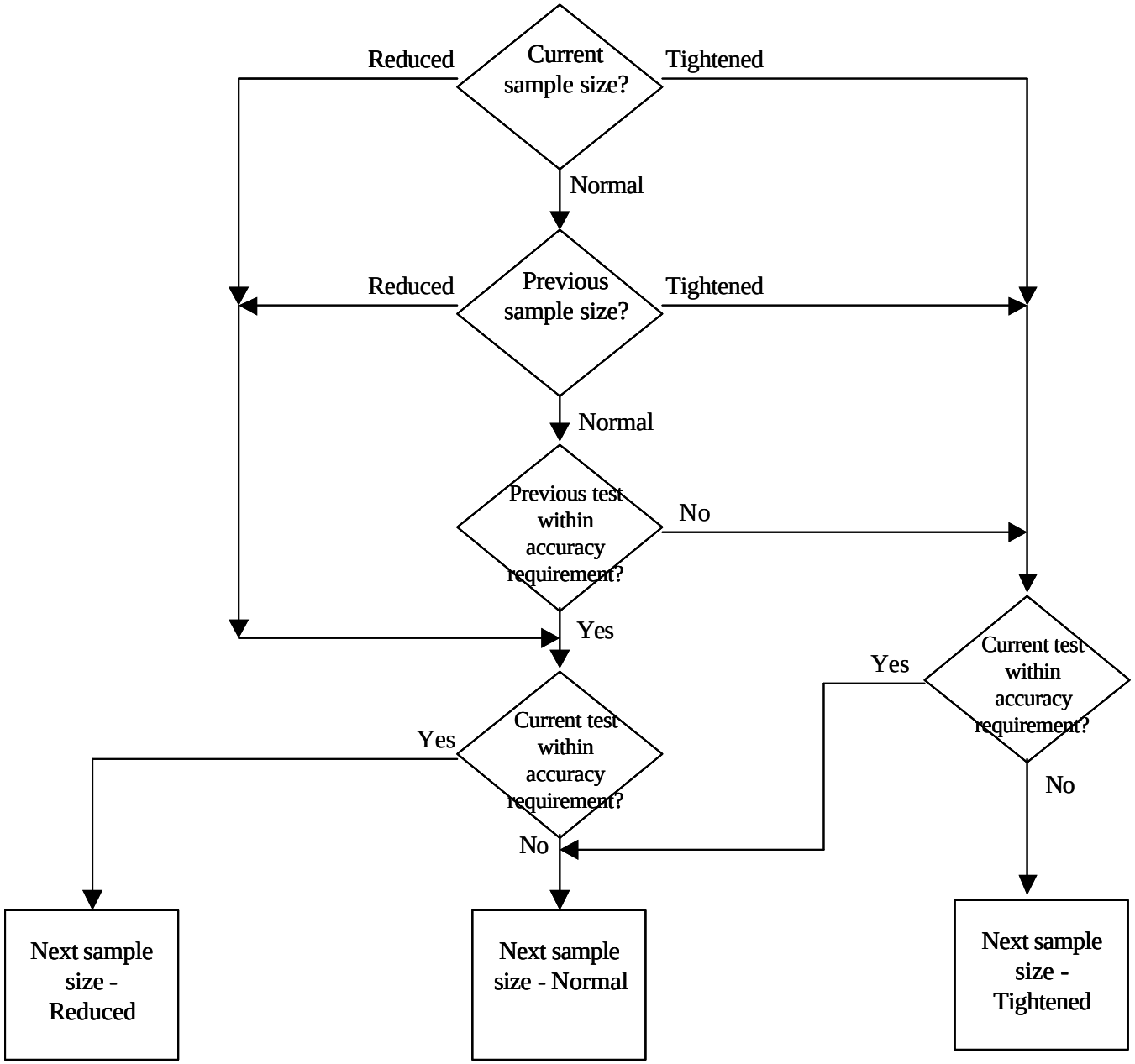
Schedule 13 – Metering Installation Type 7 - Sample Testing

1. Sample Size

(a) The *Responsible Person* must ensure that the sample size is in accordance with Table 11.1 below.

(b) The *Responsible Person* must ensure that the sample size for the first two validation tests is based on a normal sample size.

(c) The *Responsible Person* must ensure that the sample size for subsequent validation tests is based on the following:



Number of devices in Inventory Table	Sample size		
	Reduced	**Normal**	**Tightened**
2 to 8	2	2	3
9 to 15	2	3	5
16 to 25	3	5	8
26 to 50	5	8	13
51 to 90	5	13	20
91 to 150	8	20	32
151 to 280	13	32	50
281 to 500	20	50	80
501 to 1200	32	80	125
1201 to 3200	50	125	200
3201 to 10000	80	200	315
10001 to 35000	125	315	500
35001 to 150000	200	500	800
150001 to 500000	315	800	1250
500001 to over	500	1250	2000

Table 11.1: Sample size

2. Geographic area

The *Responsible Person* must ensure that a sample geographic area is randomly selected that contains the number of devices, as set out in the Inventory Table, as required by the sample size. The selection of the geographic area must be such that each device has an equal chance of being included in the sample.

3. Frequency of Tests

(a) The *Responsible Person* must ensure that the validation test is conducted at least once every six (6) months, commencing from the first validation test.

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

Schedule 14 – Capabilities of Metering Providers for Metering Installation Type 5

Categories of Metering Provider

A person may seek accreditation as a *Metering Provider* for type 5 *metering installations* in the following categories:

1. Meter provision

(A) Installation only of the whole-current (direct connected) *meter* and *data logger;* or

(B) Provision, installation and maintenance of the *meter, current transformer* (where required) and *data logger*; and/or

2. Metering data services

(A) Collection only of *energy data*; or

(B) Collection, processing and transfer of *energy data.*

1. Meter provision

(A) Installation only of the meter and data logger

Metering Providers, who apply for accreditation as a *Metering Provider* to install only the whole-current (direct connected) *meter* and *data logger* of a type 5 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) knowledge and understanding of the relevant sections of this *Metrology Procedure* and the *Code*; and

(2) knowledge of equipment (*meters, data loggers)*..

(b) Installation of *metering installations*, including:

(1) where the *Metering Provider* for the installation of the *meter* and/or *data logger* has been engaged by a person other than the *Responsible Person*, a requirement to only install a *meter* and/or *data* logger provided by the *Metering Provider* (for provision of the *meter*) nominated by the *Responsible Person,* and to install the *meter* and/or *data logger* so that the optical port, communications port, and/or visible display can be readily accessed for *meter* reading;

(2) the availability of trained and competent staff to install *metering installations* to determine that the installation is correct and who are accredited by the Electricity Association of NSW as Level 2 Accredited Service Providers (ASP);

(3) the availability of the appropriate equipment to install *metering installations*; and

(4) a requirement to not remove or modify an existing *interval meter*..

(c) Quality System, including a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*.

(B) Provision, installation and maintenance of the meter, current transformer (where required) and data logger

Metering Providers, who apply for accreditation as a *Metering Provider* to provide, install and maintain the *meter, current transformer* (where required) and *data logger* of a type 5 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) knowledge and understanding of this *Metrology Procedure* and the relevant sections of the *Code*;

(2) knowledge of equipment (*meters, current transformers, data loggers)*;

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

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

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

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

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

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

(3) management of the testing of all equipment to the accuracy requirements specified in this *Metrology Procedure*;

(4) certifications that all calibration and other *meter* parameters have been set, verified and recorded prior to *meters, data loggers*, etc, being released for installation;

(5) all reference/calibration equipment to be tested to ensure full traceability to *Australian Standards* through *verifying authorities* or directly from the National Measurements Laboratory; and

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

(c) Installation of *metering installations*, including:

(1) where the *Metering Provider* for the installation of the *meter* and/or *data logger* has been engaged by a person other than the *Responsible Person*, a requirement to provide the *meter* and/or *data logger* to that *Metering Provider* for installation,

(2) where the *Metering Provider* for installation of the *meter* and/or *data logger* has been engaged by the *Responsible Person*, the availability of trained and competent staff to install and test *metering installations* to determine that the installation is correct; and

(3) where the *Metering Provider* for installation of the *meter* and/or *data logger* has been engaged by the *Responsible Person*, the use of test and inspection procedures to

confirm that the *metering installation* is correct and that *metering* constants are recorded and/or programmed correctly.

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

(1) asset management plan for the direct connected *meters* and associated *data loggers*;

(2) approved test and inspection procedures to perform appropriate tests as detailed in this *Metrology Procedure*;

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

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

(e) Verification of *energy data*, as follows:

(1) on inspection, testing and/or maintenance, verification that readings, constants and multipliers are correct by direct conversion of *meter* readings.

(f) Quality System including:

(1) the calculations of accuracy based on test results, including all reference standard errors;

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

(3) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure*.

2. Metering data services

(A) Collection only of energy data

Metering Providers, who apply for accreditation as a *Metering Provider* to collect *energy data* of a type 5 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) Knowledge and understanding of the relevant sections of this *Metrology Procedure* and the *Code*; and

(2) Knowledge of equipment (*meters, current transformers, data loggers).*

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

(1) licensed access to *metering* software applicable to read the *metering* equipment installed;

(c) Collection of *energy data*, including:

(1) the availability of trained and competent staff to read the *metering* equipment;

(2) the availability of equipment required to read the *metering* equipment, check that the *meter* time clock is within the tolerances of the *Metrology Procedure*, reset the time if required, and record *meter* flags*;* and

(3) implementation of appropriate password and security controls;

(d) Quality System, including:

(1) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*.

(B) **Collection, processing and transfer of energy data**

Metering Providers, who apply for accreditation as a *Metering Provider* to collect, process and deliver *energy data* of a type 5 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) knowledge and understanding of this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) knowledge of equipment (*meters, current transformers, data loggers)*..

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

(1) licensed access to software applicable to read the *metering* equipment installed;

(2) licensed access to software to download the *meter* reading into the *metering installation database;*

(3) licensed access to software applicable to validate *meter* readings and *substitute meter* readings where required, using each of the *substitution* types;

(4) licensed access to software applicable to store the data in the *metering installation database;* and

(5) licensed access to software applicable to *estimate* half hourly data in the absence of *meter* readings, using each of the *estimation* types.

(c) Collection of *energy data*, including:

(1) the availability of trained and competent staff to read the *metering equipment*;

(2) the availability of equipment required to read the *metering equipment*, check that the *meter* time clock is within the tolerances of the *Metrology Procedure*, reset the time if required, and record *meter* flags*;*

(3) the availability of trained and competent staff to download the *meter* reading into the *metering installation database;* and

(4) implementation of appropriate password and security controls.

(d) Processing of *energy data*, including:

(1) secure storage of historical data;

(2) implementation of appropriate password and security controls;

(3) the availability of trained and competent staff to validate *meter* readings and *substitute meter* readings where required using each of the *substitution* types;

(4) the availability of trained and competent staff to *estimate* half hourly data in the absence of *meter* readings, using each of the *estimation* types; and

(5) the availability of a *sampling plan* to verify that the data held in a *meter* or *meter*/associated *data logger* and the data held in the *metering installation database* is consistent.

(e) Transfer of *energy data* to *NEMMCO* and affected *Code Participants*, including:

(1) implementation of appropriate password and security controls; and

(2) the availability of a disaster recovery guideline.

(f) Quality System, including:

(1) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) secure documentation system to maintain records.

Schedule 15 – Capabilities of Metering Providers for Metering Installation Type 6

Categories of Metering Provider

A person may seek accreditation as a *Metering Provider* for type 6 *metering installations* in the following categories:

1. *Meter provision*

   (A) Installation only of the whole-current (direct connected) *meter*; or

   (B) Provision, installation and maintenance of the *meter*, and *current transformer* (where required); and/or

2. *Metering data services*

   (A) Collection only of *energy data.*.

   (B) Collection, processing and transfer of *energy data.*.

1. Meter provision

(A) Installation only of the whole-current (direct connected) meter

Metering Providers, who apply for accreditation as a *Metering Provider* to install only the whole-current (direct connected) *meter* of a type 6 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

   (1) knowledge and understanding of the relevant sections of this *Metrology Procedure* and the *Code*; and

   (2) knowledge of *meters*..

(b) Installation of *metering installations*, including:

   (1) where the *Metering Provider* for the installation of the *meter* and/or *data logger* has been engaged by a person other than the *Responsible Person*, a requirement to only install a *meter* and/or *data* logger provided by the *Metering Provider* (for provision of the *meter*) nominated by the *Responsible Person*, and to install the *meter* and/or *data logger* so that the optical port, communications port, and/or visible display can be readily accessed for *meter* reading;

   (2) the availability of trained and competent staff to install *metering installations* to determine that the installation is correct and who are accredited by the Electricity Association of NSW as Level 2 Accredited Service Providers (ASP);

   (3) the availability of the appropriate equipment to install *metering installations*; and

   (4) a requirement to not remove or modify an existing *interval meter*.

(c) Quality System, including a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*..

(B) Provision, installation and maintenance of the meter and current transformer (where required)

Metering Providers, who apply for accreditation as a *Metering Provider* to provide, install and maintain the *meter* and *current transformer* (where required) of a type 6 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) knowledge and understanding of this *Metrology Procedure* and the relevant sections of the *Code*;

(2) knowledge of equipment (*meters*, *current transformers*);

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

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

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

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

(2) ability to program requirements by setting variables in *meters*, etc.

(3) management of the testing of all equipment to the accuracy requirements specified in this *Metrology Procedure*;

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

(5) all reference/calibration equipment to be tested to ensure full traceability to *Australian Standards* through *verifying authorities* or directly from the National Measurements Laboratory; and

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

(c) Installation of *metering installations*, including:

(1) where the *Metering Provider* for the installation of the *meter* and/or *data logger* has been engaged by a person other than the *Responsible Person*, a requirement to provide the *meter* and/or *data logger* to that *Metering Provider* for installation;

(2) where the *Metering Provider* for installation of the *meter* and/or *data logger* has been engaged by the *Responsible Person*, the availability of trained and competent staff to install and test *metering installations* to determine that the installation is correct; and

(3) where the *Metering Provider* for installation of the *meter* and/or *data logger* has been engaged by the *Responsible Person*, the use of test and inspection procedures to confirm that the *metering installation* is correct and that *metering* constants are recorded and/or programmed correctly.

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

(1) asset management plan for the whole-current (direct connected) *meters*;

(2) approved test and inspection procedures to perform appropriate tests as detailed in this *Metrology Procedure*;

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

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

(e) Verification of *energy data*, as follows:

(1) on inspection, testing and/or maintenance, verification that readings, constants and multipliers are correct by direct conversion of *meter* readings.

(f) Quality System, including:

(1) the calculations of accuracy based on test results, including all reference standard errors;

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

(3) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*.

2. Metering data services

(A) Collection only of energy data

Metering Providers, who apply for accreditation as a *Metering Provider* to collect *energy data* of a type 6 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) Knowledge and understanding of the relevant sections of this *Metrology Procedure* and the *Code*; and

(2) Knowledge of equipment (*meters, current transformers, data loggers).*

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

(1) licensed access to *metering* software applicable to read the *metering* equipment installed;

(c) Collection of *energy data*, including:

(1) the availability of trained and competent staff to read the *metering* equipment;

(2) the availability of equipment required to read the *metering* equipment; and

(3) implementation of appropriate password and security controls;

(d) Quality System, including:

(1) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*.

(B) **Collection, processing and transfer of energy data**

Metering Providers, who apply for accreditation as a *Metering Provider* to collect, process and deliver *energy data* of a type 6 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

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

(1) knowledge and understanding of this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) knowledge of equipment (*meters, current transformers*).

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

(1) licensed access to *metering* software applicable to read the *metering* equipment installed;

(2) licensed access to software to download the *meter* reading into the *metering installation database*;

(3) licensed access to software applicable to validate *meter* readings and *substitute meter* readings where required, using each of the *substitution* types;

(4) licensed access to software applicable to store the data in the *metering installation database*; and

(5) licensed access to software applicable to *estimate* data in the absence of *meter* readings, using each of the *estimation* types.

(c) Collection of *energy data*, including:

(1) the availability of trained and competent staff to read the *metering* equipment;

(2) the availability of equipment required to read the *metering* equipment; and

(3) the availability of trained and competent staff to download the *meter* reading into the *metering installation database*..

(d) Processing of *energy data*, including:

(1) secure storage of historical data;

(2) implementation of appropriate password and security controls;

(3) the availability of trained and competent staff to *estimate* data in the absence of *meter* readings, using each of the *estimation* types;

(4) the availability of trained and competent staff to validate *meter* readings and *substitute meter* readings where required using each of the *substitution* types; and

(5) the availability of a *sampling plan* to verify that the data held in the *metering installation database* is correct.

(e) Transfer of *energy data* to *NEMMCO* and affected *Code Participants*, including:

(1) implementation of appropriate password and security controls; and

(2) the availability of a disaster recovery guideline.

(f) Quality System, including:

(1) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) secure documentation system to maintain records.

Schedule 16 – Capabilities of Metering Providers for Metering Installation Type 7

Categories of Metering Provider

A person may seek accreditation as a *Metering Provider* for type 7 *metering installations* in the following category:

1. *Metering data services*

    (A) Processing and transfer of *energy data.*

1. Metering data services

(A) **Processing and transfer of energy data**

Metering Providers, who apply for accreditation as a *Metering Provider* to process and deliver *energy data* of a type 7 *metering installation*, must be able to exhibit, to the reasonable satisfaction of *NEMMCO*:

(a) Detailed knowledge of schemes for calculating *energy data* for unmetered *loads*, including:

(1) knowledge and understanding of this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) knowledge and understanding of Load Tables;

(3) knowledge and understanding of Inventory Tables; and

(4) knowledge and understanding of On/Off Tables.

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

(1) licensed access to software applicable to calculate the *energy data* for unmetered *loads*;

(2) licensed access to software applicable to validate the *energy data* calculated and *substitute* the *energy data* where required, using each of the *substitution* types; and

(3) licensed access to software applicable to store the data in the *metering installation database*.

(c) Processing of *energy data*, including:

(1) secure storage of historical data;

(2) implementation of appropriate password and security controls;

(3) the availability of trained and competent staff to calculate the *energy data* for unmetered *load*s;

(4) the availability of trained and competent staff to validate and *substitute energy data* for unmetered *load*s; and

(5) the availability of a *sampling plan* to audit that the data held in the *metering installation database* is within the accuracy limits.

(d) Transfer of *energy data* to *NEMMCO* and affected *Code Participants*, including:

(1) implementation of appropriate password and security controls; and

(2) the availability of a disaster recovery guideline.

(e) Quality System, including:

(1) a knowledge and understanding of the appropriate standards and guides, including those in this *Metrology Procedure* and the relevant sections of the *Code*; and

(2) secure documentation system to maintain records.