SERVICE LEVEL PROCEDURE:

Metering Provider Services Category B for Metering installation Types 1, 2, 3, 4, 5 and 6

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4.2	August 2014	Lee Brown	MSWG	AEMO	Aligned procedure with the National Electricity Rules regarding meter churn.

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1. GENERAL

This *service level procedure* details the requirements that *Metering Providers* must comply with when undertaking installation, provision and maintenance services for *metering installation* types 1, 2, 3, 4, 5 and 6.

1.1 Purpose

1.1.1 This *service level procedure* is established under clause 7.14.1A of the *Rules* and details the obligations, technical requirements, measurement process and performance requirements that are to be performed, administered and maintained by a *Metering Provider.*

1.1.2 This *service level procedure* details the:

(a) Obligations and technical / operational requirements in the provision, installation and maintenance of the *metering installation* by a *Metering Provider*; and

(b) Obligations assigned to the *Metering Provider* in support of the *responsible person* in order to comply with the *Rules.*

1.1.3 This document also refers to the requirements for:

(a) Accreditation of *Metering Providers* (category B);

(b) Compliance with the *Rules* and related procedures under the *Rules*; and

(c) The encouragement of good work practices.

1.1.4 This *service level procedure* relates to category B *Metering Providers* (MPB), which are *Metering Providers* who are accredited to undertake the provision, installation and maintenance of various *metering installation* types as stipulated.

1.1.5 While this *service level procedure* relates to formal obligations under the *Rules*, they should also be used as a “good practice” guide for all *metering installation*s and operations.

1.1.6 This *service level procedure* sets out the minimum requirements for a *Metering Provider* to be compliant with the *Rules* and procedures under the *Rules*.

1.2 Interpretation

1.2.1 The definition of a *Metering Provider* is a person who meets the requirements listed in S7.4 of the *Rules* and has been accredited by and is registered with *AEMO* as a *Metering Provider.*

1.2.2 In this *service level procedure* words that are shown in italics have the meaning specified in the *Rules.*

1.2.3 A reference in this *service level procedure* to a provision in the *Rules* is taken to be a reference to that provision as renumbered from time to time.

1.2.4 In this *service level procedure* words in the singular include the plural and words in the plural include the singular.

1.2.5 In this *service level procedure* diagrams are provided as an overview. If there are ambiguities between a diagram and the text, the text shall take precedence.

1.3 Regulatory Framework

1.3.1 In accordance with clause 7.4.1(a) of the *Rules,* the provision of *Metering Provider services* must only be carried out by a *Metering Provider.*

1.3.2 In accordance with clause 7.4.2 (a) (2) of the *Rules*, a *Metering Provider* must be accredited by *AEMO* and registered in that capacity in accordance with the qualification process.

1.3.3 In accordance with clause 7.4.2 (bb) of the *Rules,* a *Metering Provider* must comply with the provisions of the *Rules* and procedures authorised under the *Rules*.

1.4 References

1.4.1 In this *service level procedure*, a reference to a procedure includes the following:

a) NMI Procedure, is a reference to the latest version of the "National Metering Identifier Procedure";

b) '*metrology procedure*' is a reference to the *Metrology Procedure*: Part A or Part B;

c) 'MSATS Procedures' is a reference to any one or all of the following documents in accordance with the context of the provision;

i. 'CATS Procedure' is a reference to the 'CATS Procedures Principles and Obligations':

1) 'WIGS Procedure' is a reference to the Procedures for the Management of Wholesale, Interconnector, Generator and Sample (WIGS) NMIs; and

2) '*NMI Standing Data'* is a reference to the static *metering* data held within MSATS as detailed in the 'Standing Data for MSATS' document.

d) '*B2B Procedures*' is a reference to any one or all of the following documents in accordance with the context of the provision:

i. 'Customer and Site Details Notification Process'; and

ii. 'Service Order Process'.

e) 'FRMP Churn Procedure' is a reference to the 'Meter Churn Procedures' for *financially responsible Market Participants*'; and

f) '*service level procedure'* is a reference to this document.

1.4.2 The document "The Role of the *responsible person* [1]" published by *AEMO* should also be referred to as many of the compliance activities for the *responsible person* are undertaken via the *Metering Provider*.

1.5 Document Responsibility

1.5.1 In accordance with clauses 7.1.3, 7.1.4 and 7.14.1A of the *Rules*, *AEMO* is responsible for:

a) Preparing the *service level procedure* in accordance with *Rules consultation procedures*;

b) Revising the *service level procedure* in accordance with *Rules consultation procedure*; and

c) Publishing the *service level procedure*.

1.5.2 The *service level procedure* must be available for public access on the *AEMO* website

[1] Available from the AEMO website.

1.5.3 Where *AEMO* considers a proposed amendment to the *service level procedure* is of a minor or administrative nature, *AEMO* is not required to undertake consultation in accordance with the *Rules consultation procedures* but must comply with the requirements of clause 7.1.4 (e) of the *Rules*.

2. METERING PROVIDER OBLIGATIONS

2.1 Obligations

2.1.1 The *Metering Provider* is required to provide the *metering installation*, provision and/or maintenance services for all components of *metering installations* for which they are contracted and for which they are nominated as a *Metering Provider* in MSATS.

2.1.2 Subject to exclusions that are defined in clause 2.2 of this procedure, all category B *Metering Providers* must comply with this *service level procedure*.

2.1.3 A *Metering Provider* must comply with the *metrology procedure.*

2.1.4 The *Metering Provider* has responsibility for the provision of *metering* services for all *connection points* for which they are the nominated *Metering Provider* in MSATS.

2.1.5 The *Metering Provider* must remain compliant with all applicable MSATS Procedures.

2.1.6 The *Metering Provider* must maintain and operate an interface with the MSATS system for delivery of relevant *NMI Standing Data* to the *metering database.*

2.1.7 The *Metering Provider* must conform to *AEMO*'s NMI Procedure.

2.1.8 The *Metering Provider* must remain compliant with all applicable *B2B Procedures*.

2.2 Exclusions

2.2.1 *Metering Providers* Category B who perform work on *metering installations* at wholesale boundary points located within substations, undertaken on behalf of a *Transmission Network Service Provider*, are exempted from literal compliance with this *service level procedure* provided the *metering* work satisfies the performance and quality outcomes of this *service level procedure*. The complexity of work at these *connection points* is such that the specialist requirements for undertaking the *metering installation* work, in addition to the security, test and commissioning processes involved, are considered to match or exceed this *service level procedure*.

2.2.2 For service provision at *connection points* where the *Metering Provider* and the *Metering Data Provider* are part of the same company and *metering installation*, provision or maintenance work is performed using internal processes and procedures, those internal processes and procedures will be deemed to be compliant with this *service level procedure* if the *metering* work satisfies the performance and quality outcomes of this *service level procedure*.

3. METERING PROVIDER SERVICES

3.1 Services

3.1.1 The *Metering Provider* is responsible for the provision of *metering* services to provide, install and maintain a *metering installation*, which includes, but is not limited to:

a) The provision, storage and m*aintenanc*e of *metering register* information.

b) Maintain the ongoing *metering installation* compliance with the *Rules*, procedures under the *Rules* and relevant *metrology procedure*

c) The provision and maintenance of physical *metering installation* security controls;

d) The provision, installation and maintenance of the *metering installation*;

e) The maintenance of *metering installation* password security;

f) The development and maintenance of a Metering Asset Management Plan; and

g) The support of the audit process of *metering installations* and centralised review process undertaken by *AEMO*.

3.1.2 Even though a *Metering Provider* may perform certain obligations on behalf of the *responsible person*, the *responsible person* has overall responsibility for the *metering installation*.

3.2 Engagement of Metering Providers

3.2.1 The *Rules* provide a basis for *Metering Providers* to be engaged by the *responsible person*. The *responsible person* must ensure that all facets of the *metering installation* are maintained and may engage any number of *Metering Providers* to undertake the different components of work for each *metering installation* (e.g. to design the installation; install *instrument transformers*; install *meters*; install data communications; conduct tests; conduct ongoing maintenance).

3.2.2 *Metering Providers* are required to be registered with *AEMO*, and have the specific qualifications and the capability to meet the defined performance standards.

3.3 Restrictions on Metering Providers

3.3.1 No *Market Generator* or *Market Customer* which is involved in the trading of *energy* may be registered as a *Metering Provider* for *connection points* in respect of which the *metering data* relates to its own use of energy; and

3.3.2 If a *Market Participant* is a *Market Customer* and also a *Network Service Provider*, then the *Market Participant* may register as a *Metering Provider* for that *connection point* in accordance with the requirements of clause 7.4.2(d) and 7.4.2(e) of the *Rules*.

3.4 Accreditation

3.4.1 *Metering Providers* providing services in the *National Electricity Market* must be accredited by and registered with *AEMO*.

3.4.2 The accreditation requirements are set out in the accreditation checklists for each category of *metering installation* and include requirements as set out in:

a) Chapter 7 of the *Rules*; and

b) Authorised procedures under the *Rules*.

3.4.3 Circumstances where *AEMO* may require a *Metering Provider* to review its accreditation and subsequently apply for re-accreditation may include:

a) Where a *Metering Provider* has been de-registered and seeks re-registration;

b) Where a *Metering Provider* has been suspended from providing services under certain categories and seeks to have the suspension lifted;

c) Subsequent changes to *Rules* requirements, Procedures under the *Rules*, or *service level procedures*. This is likely to apply in instances where *Rules* changes have been made or new versions of the *metrology procedure* have been issued which require significant functional system, process or procedural changes to be made by *Metering Providers*.

d) Significant changes or upgrades to the *Metering Provider's* existing systems or a system platform change. The *Metering Provider* must apply and be re-accredited prior to implementing the changes into their production

environment and accepting or transmitting any *market* transactions, in accordance with the *Metering Service Provider* Accreditation Procedure; and

e) Organisational mergers and acquisitions.

3.5 Disputes

3.5.1 If a dispute arises between the *Metering Provider* and *AEMO*, a *Registered Participant*, a *Metering Data Provider* or any other *Metering Provider*, in relation to the provision of *metering* services or this *service level procedure*, then the Dispute Resolution process as detailed in clause 8.2 of the *Rules* shall apply.

3.6 Use of Sub-Contractors

3.6.1 If an accredited *Metering Provider* intends to engage sub-contractors (who do not have *Metering Provider* accreditation) to perform any of their obligations, they must ensure that auditable processes are in place to certify that all work performed by the sub-contractor on behalf of the *Metering Provider* is compliant with the *Rules* and this *service level procedure.*

3.6.2 While the *Metering Provider* may contract out *metering* work, the *Metering Provider* may not delegate any of their responsibilities under the *Rules*. The *Metering Provider* is responsible and liable for all acts and omissions of the sub-contractor as if they were acts and omissions of the *Metering Provider*.

3.7 Insurance

3.7.1 The *Metering Provider* must effect and maintain for the duration of the *Metering Provider's* registration and accreditation:

a) General liability insurance; and

b) For a period of seven years after termination of the *Metering Providers* registration, professional indemnity insurance, for an amount of not less than $10,000,000 total, covering potential claims against the *Metering Provider*.

3.7.2 The *Metering Provider* must provide *AEMO* with certified copies of the insurance policy required pursuant to this *service level procedure*, when requested.

3.8 Professionalism

3.8.1 In order to achieve a common approach to services across *Metering Providers* and *Metering Data Providers* in the *National Electricity Market*, each *Metering Provider* must develop, document and apply its procedures for the services in cooperation with *AEMO* and each relevant *responsible person* and *Network Service Provider* to facilitate the effective management of relevant *NMI Standing Data* and *metering data* information flows.

3.8.2 *Metering Providers* must ensure that sufficient competent people are recruited and maintained in order to meet the *Metering Provider's* obligations and performance requirements.

3.8.3 *Metering Providers* must use reasonable endeavours to establish the necessary working relationships with other *Metering Providers* and *Metering Data Providers* to ensure that matters affecting customer transfer, *meter installation*, provision and maintenance, and maintenance of relevant *NMI Standing Data* are achieved proficiently.

3.8.4 *Metering Providers* must assist *AEMO* with reasonable requests for the provisioning of *metering data* and relevant *NMI Standing Data* information relating to *connection points* that are part of the market audit process conducted by *AEMO*.

4. PERFORMANCE

4.1 Metering Processes

4.1.1 *Metering Provider* General Requirements

a) Operation of the *National Electricity Market* requires the installation, provision, and maintenance of *metering installations* for the purposes of providing accurate recording of *energy* flows to facilitate associated financial transactions. These *energy* flows are metered using equipment provided, installed and maintained by *Metering Providers*; and

b) *Metering register* information and relevant *NMI Standing Data* management is to be updated and maintained and communicated to *AEMO*, as well as to *Market Participants* who have rights of access under the *Rules*.

c) Note: For the purpose of clarification, any clauses in this document that relate to a type 1, 2, 3 and 4 *metering installation* are taken to also apply to an interval *metering installation* with *remote acquisition* for a small customer (except for Victorian Advanced Metering Infrastructure (AMI) Rollout) until the metrological requirements are formalised through the National Smart Meter process.

4.1.2 Regulatory Knowledge

a) The *Metering Provider* is required to maintain current knowledge on the *Rules*, *metrology procedure*(s), *Australian Standards*, relevant International Electrotechnical Commission (IEC) standards, and all other relevant

standards and codes (e.g. wiring regulation, jurisdictional documents, SIRs, etc.).

4.1.3 Registration Process

a) The *Metering Provider* role is essential to the successful collection of relevant *NMI Standing Data* and allocation of the relevant *NMI Standing Data* to *Market Participants* for registration processing purposes.

4.1.4 *Metering Provider* Processes

a) For the services that they provide, the *Metering Provider* must have processes and systems in place in the following areas:

i. Purchasing of *metering* equipment;

ii. Provision of *metering* equipment;

iii. Installation of *metering* equipment;

iv. Commissioning and verification of *metering* equipment;

v. Testing and inspection of *metering* equipment;

vi. Maintenance of *metering* equipment;

vii. Programming of *metering* equipment;

viii. Asset management planning;

ix. Security of *metering installations* and *energy data*;

x. Relevant *NMI Standing Data* management;

xi. Management of MSATS interface;

xii. Management of meter churn;

xiii. Support Management of B2B processes where required;

xiv. Communication links to *AEMO*, *Market Participants* and other service providers;

xv. Quality system certification;

xvi. Processes for the maintenance and update of relevant *Rules*, Licences, Procedures and Standards; and

xvii. Training and maintenance of resource skills.

4.2 Registration of Metering Installations

4.2.1 The *metering* registration process is to be coordinated by the *Metering Provider* in cooperation with the *responsible person*.

4.3 Connection Point Transfer

4.3.1 The *Metering Provider* is required to facilitate the timely commissioning of the *metering installation* and the confirmation of the *metering installation* details. The *Metering Provider* is required to conform to *AEMO*'s procedures as amended from time to time.

4.3.2 In order to support the retail transfer of a *connection point*, the *Metering Provider* must comply with the appropriate provisions of the following procedures:

a) 'MSATS Procedures: CATS Procedures Principles and Obligations'. This document contains the principles governing consumer transfer, *metering installation* registration and *NMI Standing Data* management. The document

also defines the identities and obligations placed on *Market Participants* arising from these principles;

b) *'NMI Standing Data* for MSATS'. This document contains information relating to *NMI Standing Data* requirements in MSATS; and

c) 'NMI Procedure' is a reference to the latest version of the "National Metering Identifier Procedure".

4.4 NMI Standing Data Requirements

4.4.1 The *Metering Provider* is to establish and maintain a register of site details and parameters (relevant *NMI Standing Data*) for each specified *metering installation* as follows:

a) Adhere to the assignment protocol of the *NMI* for all *connection point* details and *data streams*;

b) Conform to the requirements of the 'MSATS Procedures: CATS Procedures Principles and Obligations' with respect to the transfer of a *connection point* and the update and maintenance of relevant *NMI Standing Data* information within MSATS system;

c) Conform to the requirements of the *B2B Procedures* where applicable for the provision of relevant *NMI Standing Data* and *metering installation* services;

d) Forward a sub-set of the relevant *NMI Standing Data* information to MSATS in support of the *NMI* Discovery process;

e) Store the relevant *NMI Standing Data* in a manner that facilitates an auditable process and an efficient exchange of information with MSATS, *AEMO*, *Market Participants* and other service providers; and

f) Maintain and update the MSATS system with the required relevant *NMI Standing Data* information as detailed within the MSATS Procedures.

4.4.2 *AEMO* will undertake performance monitoring on the quality of relevant *NMI Standing Data*, and compliance of *Metering Providers* to this *service level procedure*.

4.4.3 The character and syntax details relating to relevant *NMI Standing Data* information is listed in the latest version of the *AEMO* document 'Standing Data for MSATS'. This document is available from the *AEMO* website.

4.5 Metering Register

4.5.1 The *Metering Provider* is required to maintain a *metering register* to contain the details as listed in S7.5.2 (b) sub clauses (5), (6) and (7) of the *Rules*.

4.5.2 The *Metering Provider* is required to provide the *metering register* information, as detailed above, on request to the respective *Market Participants* who have the right of access to the *metering register* information. Information held in the *metering register* is to be accessible on-line for a minimum of 13 months and may be archived after this period. The information must be retained for seven years. Archiving facilities are required to transfer data, no longer required, on-line at regular intervals (e.g. monthly) into a longer-term, but accessible storage. Retrieval mechanisms are required that allow the data to be recovered and re-evaluated for review purposes. It is not a requirement that the information be retrieved to the original storage facility, but the retrieval mechanism must facilitate manual analysis and manipulation using the same processing rules as for the original *metering register* information.

4.6 MSATS Procedures

4.6.1 The *Metering Provider* must meet the obligations and performance requirements of the *Metering Provider's* role and functions as defined within the 'MSATS Procedures: CATS Procedures Principles and Obligations'.

4.7 B2B Procedures

4.7.1 The *Metering Provider* must meet the obligations and performance requirements of the *Metering Provider's* role and functions as defined within the Business to Business Procedures.

4.8 Meter Churn Management

4.8.1 The *Metering Provider* must provide relevant *NMI Standing Data* and *metering register* information to support the requirements of the FRMP Churn Procedure.

4.8.2 The *Metering Provider* must only undertake meter churn when the request to do so has been provided by a *responsible person*, or a *financially responsible Market Participant* in accordance with the FRMP Churn Procedure.

4.9 Metering Provider (MPA) Interfaces

4.9.1 *Metering Providers* category A (MPA) are *Metering Providers* who are accredited to undertake installation only of type 5 and 6 whole current *meters*. The *responsible person* is required to engage a *Metering Provider* or *Metering Providers* to undertake the provision, installation and maintenance of a *metering installation*. Where a *Metering Provider* category A is engaged by the *responsible person* to perform installation work only, the *Metering Provider* category B must, on behalf of the *responsible person*, ensure that processes are in place to ensure that interfaces with the *Metering Provider* category A are established to ensure that:

a) Provision of *metering* equipment is undertaken in a timely manner;

b) Transition of relevant *metering installation* relevant *NMI Standing Data* information into systems and processes are carried out; and

c) The *metering* equipment is maintained by inclusion in the relevant test strategy within the associated Metering Asset Management Plan.

4.10 Compliance

4.10.1 While the overall responsibility lies with the *responsible person*, *Metering Providers* are required to provide copies of test or commissioning details to any new *Metering Provider* or *responsible person* upon request.

4.10.2 The *Metering Provider* must ensure that the *metering installation* is installed and maintained in accordance with the *metrology procedure*.

4.11 General Commissioning Requirements

4.11.1 The *Metering Provider* must use reasonable endeavours to ensure that the *metering installation* is compliant and carry out the following *metering installation* commissioning checks.

4.11.2 Wiring checks

a) The *Metering Provider* must verify that the:

i. *Metering installation* equipment and associated wiring is correct;

ii. *Metering installation* complies with manufacturer requirements, relevant standards and jurisdictional documents;

iii. All wiring terminations are tight and correctly terminated;

iv. Cable type and sizes used are correct; and

v. Phase sequence and polarity are correct.

4.11.3 Accuracy requirements

a) The *Metering Provider* must establish that the accuracy class of all the *metering* equipment associated with an *metering installation* and any documentation verifying the errors of *current transformers*, *voltage transformers* and *meters* show compliance with the *Rules*. The name plate data reflects the design accuracy class of the *metering* equipment.

b) The *Metering Provider* must carry out all reasonable directions of the *responsible person* to establish *metering installation* compliance.

4.11.4 Multiplier Validation

a) For *metering installations* that utilise *instrument transformers*, (*voltage transformers* and/or *current transformers*), the *Metering Provider* must verify the connected ratios of all *instrument transformers* on site and calculate the constant to be applied to the *meter* readings and *metering data*.

4.11.5 Metering Transformer Burden Measurement

a) For *metering installations* that utilise *instrument transformers*, (*voltage transformers* and/or *current transformers*), the *Metering Provider* must undertake measurements of the actual secondary burdens of the *instrument transformers* pertaining to the *metering installation* to ensure that the burdens applied to the *instrument transformers* are within the rated burden specified on the nameplate.

4.11.6 Phase Sequence

a) The *Metering Provider* must verify that the *metering installation* voltage phase sequence relationships are correct unless the *Metering Provider* can verify to the satisfaction of *AEMO* the accuracy of the meter type when non-standard phase sequence is applied.

4.11.7 Vector Relationships

a) For *metering installations* that utilise *instrument transformers*, (*voltage transformers* and/or *current transformers*), the *Metering Provider* must verify that the combined current and voltage phase relationships at the *meter* terminals are correct.

4.11.8 *Meter* Validation

a) For all *metering installation* types, the *Metering Provider* must verify that the *meter* programming parameters, display and error functions are all correct in accordance with manufacturer specifications. This includes the measurement of the forward rotation of energy applied to the *meter*, and verifying that the correct pulse rates (for interval meters) have been programmed into the *meter* for the best possible resolution of *energy data* measurement and recording.

b) For *metering installations* that involve the use of *instrument transformers*, the *Metering Provider* must validate register readings to the measured customer *load* where applicable and possible. The validation process may also include a timing check by comparing the output on the *meter* display and/or pulse indicators against *load* and time.

c) For sites involving *remote acquisition* of *metering data*, the *Metering Provider* must have processes in place to aid in the validation of *interval metering data* with the *responsible person* and/or *Metering Data Provider*.

i. This process must confirm that remote communication with the *meter* is established and is of sufficient quality to support communication and *metering data* transfer.

ii. This verification is to be done at the time of *meter installation*, *meter* change, meter test or meter reprogramming. Refer also to section 4.12 relating to the meter change process for Type 1, 2, 3 and 4 sites.

iii. The *Metering Provider* must also aid any end to end verification of the measured and stored *interval metering data* within the *meter's* buffer with the *interval metering data* value(s) as remotely read and stored within the *Metering Data Provider*'s *metering data services database.*

iv. The *Metering Provider* must have processes in place to aid in the validation of *metering data* with the *responsible person* and/or *Metering Data Provider.* Where a validation failure has occurred, the *Metering Provider* is required to have a process in place to verify *metering installation* compliance.

4.11.9 Sites that cannot be validated

a) For sites that cannot be fully validated, the *Metering Provider* must inform the *Metering Data Provider* and the *responsible person* that the *metering installation* cannot be fully validated. The *Metering Provider* is required to liaise with the *responsible person* to undertake other alternative measurements and commissioning checks that enable the *responsible person* to agree that the *metering installation* is compliant.

b) The *Metering Provider* must undertake one or more of the following checks:

i. Utilisation of *meter energy* measurement to calculate *load* / demand and that this value is reflective of expected magnitude;

ii. Use of a dummy load or phantom load box to verify correct *meter energy* measurement;

iii. Wiring checks which visibly verify correct connection and phase relationships of voltage and current circuits; or

iv. Compare *meter* measurement of *energy* / *load* with an alternative measurement of demand, current etc.

4.11.10 Alarm settings

a) Where the *meter* supports alarm functionality as an attachment to the *interval metering data*, the *Metering Provider* is required to enable the following alarms:

i. Power failure;

ii. Voltage failure;

iii. Pulse or interval data overflow;

iv. Checksum error; and

v. Time reset.

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

4.11.11 In situ testing of type 1, 2, 3 and 4 *metering installations*

a) Where a *Metering Provider* undertakes to perform in situ testing of a type 1, 2, 3 and 4 *metering installation*, the *Metering Provider* must note the start

and end times of the *meter* test and any applicable register readings and record these on the relevant test sheet.

b) On completion of the tests the *Metering Provider* must ensure that the following is undertaken before the *Metering Provider* leaves the site:

i. Ensure that the *metering installation* is commissioned into service and that all connections are correct, tight and that the measurement system is operating correctly. Adherence to section 4.11, General Commissioning Requirements, is required;

ii. The *Metering Provider* is required to contact the relevant *Metering Data Provider* and verify that the *Metering Data Provider* still has operational communications with the *meter* and that the communications are of sufficient quality to support *metering data* transfer; and

iii. The *Metering Provider* is required to inform the *Metering Data Provider* of the start and end times of the test and the *metering* details concerned. (This is to facilitate the *Metering Data Provider* validating and substituting out any erroneous *metering data* as a result of the *meter* test).

c) On completion of the *metering installation* test, the *Metering Provider* is required to provide to the relevant *Metering Data Provider*, by formal communication, confirmation of the above details and test times. Refer section 4.14 for *meter* change process performance requirements and Attachment 1 for example forms. These forms are available from *AEMO*'s website.

4.12 Meter Change Process From Installation Types 1, 2, 3 or 4

4.12.1 Where a *Metering Provider* undertakes to perform *metering installation* changes from a type 1, 2, 3 or 4 to a type 1, 2, 3, 4 or 5 *metering installation* (and to a type 6 subject to the jurisdictional reversion policy in the *metrology procedure*), the *Metering Provider* must undertake the following activities before carrying out any installation change:

a) The *Metering Provider* must make reasonable endeavours to contact the current *Metering Data Provider* prior to undertaking any change of metering and:

i. Provide the current *Metering Data Provider* with the details of the new *Metering Data Provider and new Metering Provider*;

ii. Request and verify that the current *Metering Data Provider* undertakes a final read to recover any *metering data* since the *meter* was last interrogated; and

iii. Note the *metering installation* details and times on the relevant Meter Change Installation Notice or site commissioning test sheet.

4.12.2 On completion of the *metering installation* the *Metering Provider* must ensure that the following is undertaken before the *Metering Provider* leaves the site:

a) Ensure that the *metering installation* is commissioned into service and that all connections are correct, tight and that the measurement system is operating correctly. Adherence to section 4.11, General Commissioning Requirements, is required; and

b) For a site remaining a type 1, 2, 3 or 4 installation, verify that there are operational communications with the *metering installation* and that the communications are of sufficient quality to support the *remote acquisition* of *metering data*.

4.12.3 The *Metering Provider* is required to provide to the new *Metering Data Provider* formal confirmation of the above *metering installation* details and commissioning times. Refer section 4.14 for meter change process performance requirements and Attachment 1 for example forms.

4.13 Meter Change Process From Installation Types 5 or 6

4.13.1 Where a *Metering Provider* undertakes to perform *metering installation* changes from a type 5 or 6 to a type 1, 2, 3 or 4 *metering installation*, the *Metering Provider* must undertake the following before carrying out any installation change:

a) The *Metering Provider* must first contact the current *Metering Provider* and/or *Local Network Service Provider* and is required to:

i. Inform the current *Metering Provider* and/or *Local Network Service Provider* of the *Metering Provider's* identity and that a *meter* change is to be carried out; and

ii. Note the *metering installation* details and times on the relevant site commissioning test sheet.

4.13.2 On completion of the *metering installation* the *Metering Provider* must ensure that the following is undertaken before the *Metering Provider* leaves the site:

a) Ensure that the *metering installation* is commissioned into service and that all connections are correct, tight and that the measurement system is operating correctly. Adherence to section 4.11, General Commissioning Requirements, is required; and

b) For a site remaining a type 1, 2, 3 or 4 installation, verify that there are operational communications with the *metering installation* and that the communications are of sufficient quality to support the *remote acquisition* of *metering data*.

4.13.3 The *Metering Provider* is required to provide to the new *Metering Data Provider* by formal confirmation of the above *metering installation* details and commissioning times. Refer section 4.14 for meter change process performance requirements and Attachment 1 for example forms.

4.14 Metering Installation Change Process

4.14.1 In relation to the performance requirements tabulated below, and shown in Figure 1 'Performance Requirements -Time Schedule' in section 4.15, the following details apply to the performance of a *metering installation* by a *Metering Provider*.

TASK ID (AS IN FIG 1)	REQUIREMENT	DETAIL
1	Process MSATS Change Request notification (one *business day*) Accept/Reject Work.	The *Metering Provider* must process the MSATS notification that nominates them as an MPB for a *connection point*. This notification should be also taken as a *metering installation* advice.
2	Receive advice from *responsible person* / B2B Process (one *business day*).	The *Metering Provider* is required to acknowledge the receipt of notification or otherwise within one *business day* of receipt of any *metering installation* advice via formal communication.

TASK ID (AS IN FIG 1)	REQUIREMENT	DETAIL
3	Notify *Metering Data Provider* and/or *responsible person* by formal communication, advising of the *metering installation* change (one *business day*).	The *Metering Provider* must give the notified party a period to comment on the proposed *meter* change (i.e. password availability, compatibility issues if any etc).
4	Await notified party comment (two *business days*).	The *Metering Provider* must wait two *business days* for any comment from the *Metering Data Provider* and/or *responsible person* re the proposed meter change.
5	Obtain site information from current *Metering Provider*, LNSP and MSATS (two *business days*).	The *Metering Provider* is required to request all necessary installation and site information from the current *Metering Provider*, *Local Network Service Provider*, *financially responsible Market Participant* and MSATS where available.
6	Provision of requested Installation Information (two *business days*).	The current *Metering Provider* is required to provide the requested *metering installation* information for a *connection point* to a New *Metering Provider*.
7	Accept / Reject work (one *business day*).	The *Metering Provider* is required to advise the *financially responsible Market Participant* and/or *responsible person* whether the *Metering Provider* accepts responsibility for the installation work etc. This includes, where relevant, submitting any objection 'OBJ' code into MSATS, which must be provided within five *business days* of the MSATS notification. An action of not objecting constitutes acceptance.
8	Schedule and undertake work (up to 10 *business days*).	The *Metering Provider* must ensure that the installation work is scheduled and completed within this time frame. This item includes: 1. Program and readiness of installation equipment; 2. Site access and any outage arrangements in accordance to jurisdictional regulatory requirements; 3. Change of required *metering installation* equipment; 4. Test and commissioning of installation in conjunction with *Metering Data Provider* where applicable; and 5. Preparation and submission of relevant advices.

TASK ID (AS IN FIG 1)	REQUIREMENT	DETAIL
9	Update systems (up to five *business days*). The *Metering Provider* is required to commence this update within five *business days* of the completion of item 8.4 above (test and commissioning of installation).	The *Metering Provider* is required to ensure that all relevant *NMI Standing Data* information for the *connection point* is updated. This process includes: 1. Entry and update of relevant *NMI Standing Data* information into the *Metering Provider's* systems and databases; 2. Provision of Meter Change installation Notice to the respective *responsible person* and *Metering Data Provider*(s) for the *connection point*; and 3. Entry of relevant *NMI Standing Data* into MSATS must occur within five *business days* of the *Metering Provider* role for the *connection point* becoming effective within MSATS.
10	Return removed *metering installation* component(s) (up to ten *business days*).	The *Metering Provider* is required to return any removed *metering installation* component(s) to its owner. Reasonable endeavours are required in the packaging of the equipment to ensure its return in good order.
11	Provide / support registration validation test data (up to three *business days*)	Where support is still required to the *responsible person* and/or *Metering Data Provider* in the validation process of the *metering* data, the *Metering Provider* must ensure that this is carried in an effective manner.

4.15 Performance Requirements

4.15.1 The *Metering Provider* must complete all *metering installation* changes within the following timeframes, unless the *Metering Provider* is carrying out a *metering installation* change to meet a *Network Service Provider* (NSP) regulated obligation. For *metering installation* changes to meet a NSP regulated obligation, the installation period will be established in agreements between the NSP and the *Metering Provider* to reflect the NSP's regulatory obligations.

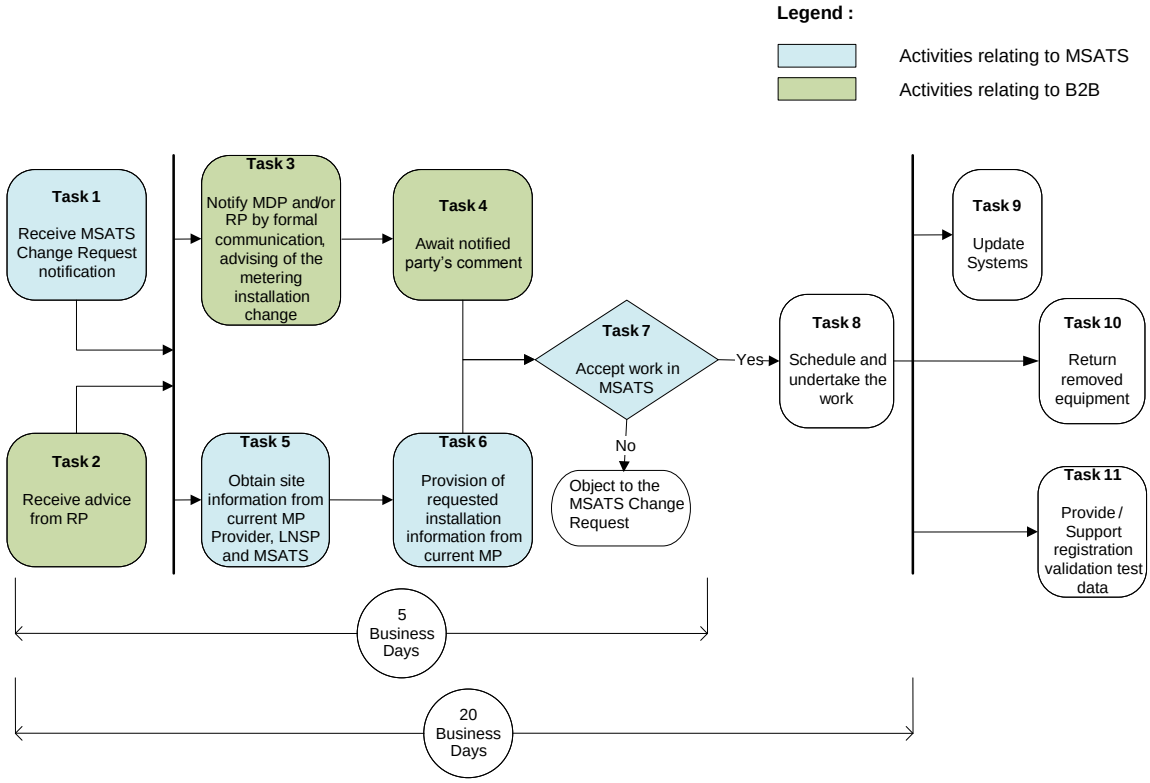
a) The *Metering Provider* must use reasonable endeavors to complete Tasks 1 to 8 inclusive (as listed in the above table) within a maximum period of 20 *business days*.

b) The performance requirements for Tasks 1 to 8 inclusive apply to all contestable *metering installation* changes for which the *Metering Provider* must obtain:

i. A minimum performance requirement of 95% for all *metering installation* changes (within the maximum period); and

ii. A 100% compliance for all *metering installation* changes within twice the stated maximum time frame, unless a separate time frame has been agreed to in writing with the *responsible person*.

Figure 1: Performance Requirements - Time Schedule



Refer to sections 4.12, 4.13 and 4.14 for clarification of Task items.

Although the tasks have been shown as sequential activities some of the tasks may overlap with one another

4.16 Reporting

4.16.1 *AEMO* will undertake to provide regular reports to the *Metering Provider* relating to quality and timeliness of deliverables as part of *AEMO*'s performance monitoring and benchmarking processes.

4.16.2 The content of the *Metering Provider* reports will reflect performance monitoring across all *Metering Providers* with respect to the deliverables of this s*ervice level procedure*.

4.16.3 The frequency of the *Metering Providers* reports provided by *AEMO* will be nominally monthly, unless otherwise advised.

4.17 Corrective Action

4.17.1 The *Metering Provider* is required to take corrective action on:

a) Any reported instances of non-compliance documented within either the monthly reporting process or through the scheduled *Metering Provider* audit process; and

b) Any reported or found *metering installation* faults for which that *Metering Provider* has been engaged by the *Responsible Person* to maintain, in accordance with clause 4.26 of this procedure.

4.18 Meter Change Information Requirements

4.18.1 The *Metering Provider* must provide, where applicable to the specified *metering installation*, the following information in an electronic format to the *responsible person*, relevant *Market Participants* or any other *Metering Providers* and

Metering Data Providers who have a right of access to the information, as a minimum, pertaining to any *metering installation* changes.

4.18.2 Equipment installation

INFORMATION CATEGORY	DETAILS
NMI details	*NMI* Check Sum
NMI address	Street State Postcode
Market Participants	Financially Responsible Market Participant *Responsible Person* Local Retailer *Metering Provider* B *Metering Provider* C *Metering Data Provider* *Local Network Service Provider*
Modem details	Modem Make Modem Type Modem Plant Modem Phone Modem Baud Modem Carrier
Meter details	Meter Make Meter Type Meter Rating Meter Serial Number Meter Pulse Rate Meter Multiplier Unit Address Load Survey Interval Programmed Current Transformer Ratio Programmed Voltage Transformer Ratio

INFORMATION CATEGORY	DETAILS
Current Transformer(s)	Current Transformer Make Current Transformer Type Current Transformer Class Current Transformer Ratios Current Transformer Tap Current Transformer Rated Burden Current Transformer Serial Number Phase 1 Current Transformer Serial Number Phase 2 Current Transformer Serial Number Phase 3 Current Transformer Secondary Wiring Size Current Transformer Secondary Wiring Route Length Primary Current Secondary Current
Voltage Transformer(s)	Voltage Transformer Make Voltage Transformer Type Voltage Transformer Class Voltage Transformer Ratios Voltage Transformer Tap Voltage Transformer Rated Burden Voltage Transformer Serial Number Phase 1 Voltage Transformer Serial Number Phase 2 Voltage Transformer Serial Number Phase 3 Voltage Transformer Secondary Wiring Size Voltage Transformer Secondary Wiring Route Length

4.21.1 Equipment Removal

INFORMATION CATEGORY	DETAILS
NMI details	*NMI* Check Sum
NMI address	Street State Postcode
Market Participants	Old *Metering Data Provider* ID Old *Metering Provider* ID
Meter details	Meter Make(s) Meter Type(s) Meter Rating Meter Serial number(s)
Current Transformer(s)	Removed Current Transformer Serial number(s) Removed Current Transformer Type(s) Removed Current Transformer Make(s)

INFORMATION CATEGORY	DETAILS
Voltage Transformer(s)	Removed Voltage Transformer Serial Number(s) Removed Voltage Transformer Type(s) Removed Voltage Transformer Make(s)
Removal details	Service Order Number Work Order Number Meter Remove Date Meter Remove Time
Meter reading(s)	Meter Reading(s) Data downloaded (Type 1, 2, 3 and 4) Date/time of download

4.23.1 Forms

a) Sample forms are provided in Attachment 1, a Microsoft Excel version of these forms is available from *AEMO* on request.

4.24 Asset Management Plans

4.24.1 The *Metering Provider* must develop, maintain and execute a Metering Asset Management Plan (MAMP) for all *metering installation* assets for which the *Metering Provider* has been engaged to provide maintenance and testing services by the *responsible person*, which is to be approved by *AEMO*.

4.25 Testing and Inspection

4.25.1 The *Metering Provider,* where engaged by the *responsible person* to carry out testing and inspection services of *metering installations*, must do so in accordance with S7.3 of the *Rules*.

4.25.2 The *Metering Provider* is required to provide on request test results for *metering installation* equipment to relevant *Market Participants* of the *connection point* or any other *Metering Providers* pertaining to the *connection point.*

4.26 Management of Metering Installation Faults

4.26.1 A *Metering Provider* who identifies a *metering installation malfunction* must advise the *Metering Data Provider* and *responsible person* within two *business days*.

4.26.2 In accordance with clause 7.3.7 of the *Rules*:

a) If a *metering installation malfunction* occurs, repairs must be made to the *metering installation* as follows:

i. For a type 1, 2 or 3 *metering installations,* within two *business days* of detection. The *Metering Provider* must notify the *Metering Data Provider* so that any relevant substitutions can be made to the *metering data*.

ii. For a type 4, 5 or 6 *metering installations*, within 10 *business days* of detection. The *Metering Provider* must notify the *Metering Data Provider* so that any relevant substitutions can be made to the *metering data*.

b) If the repairs cannot be made within the time specified as in clause 4.26.2 a) subsection (i) and (ii), the *Metering Provider* must notify the *responsible*

person, so that the *responsible person* can apply to *AEMO* for an 'Exemption'.

4.27 Telecommunications

4.27.1 The *Metering Provider* must notify the *Metering Data Provider* and *responsible person* if communications equipment is to be temporarily disconnected such that it may affect the *remote acquisition* of *metering data.*

4.27.2 The *Metering Provider* must assist the *responsible person* and/or the *Metering Data Provider* with the manual collection of *metering data* from the *metering installation* where *remote acquisition* becomes unavailable.

4.27.3 The application of clause 4.27.2 of this procedure excludes instances of a *telecommunication network* failure where the logistics of manual collection of *metering data* from significant volumes of *metering installations* is not practical. This does not remove the obligation of the *responsible person* to resolve the instance of the *telecommunication network* failure.

4.28 Systems

4.28.1 Systems procured or used by the *Metering Provider to pro*vide the services specified in this *service level procedure* shall be maintained in reasonable working condition in an accessible and auditable manner.

4.29 Quality systems

4.29.1 In accordance with the *metrology procedure* requirements and S7.4 of the *Rules*, the *Metering Provider* must:

a) For services in relation to type 1, 2, 3 and 4 *metering installations have* and retain AS/NZS ISO 9002 Quality Certification or achieve same within 12 months of accreditation as a *Metering Provider* with *AEMO*; and

b) For services in relation to type 5 and 6 *metering installations*, have and retain a quality system that meets clause S7.4.4 of the *Rules* and relevant clauses of *metrology procedure* Part A to the satisfaction of *AEMO. AEMO* has traditionally accepted quality accreditation to the ISO9001 or ISO 9002 standard, subject to the respective business system design and level of accreditation, as meeting this requirement.

4.30 Disaster Recovery

4.30.1 The *Metering Provider* must have a 'Disaster Recovery Plan' in place that, in the event of an IT system failure, the system is returned to normal operational service within five *business days*. Recovery to operational service is measured by evidence that:

a) The software and the most recent back-up of data has been restored to operational service within the five *business days*; and

b) That there is no outstanding processing or delivery of relevant *NMI Standing Data* to *AEMO* and *Market Participants*.

4.30.2 It is a requirement of the *Metering Provider* to demonstrate evidence to the effect that:

a) Detailed documentation of a Disaster Recovery Plan is maintained fully up to date. The documentation to show revisions and 'last check date';

b) The Disaster Recovery Plan is witnessed and dated at least annually by the *Metering Provider* as being current for the systems and processes in place; and

c) The Disaster Recovery Plan has been subjected to an annual end-to-end test that facilitates both a 'fail-over' from and 'recovery' back to the production system.

4.31 Security Requirements

4.31.1 The *Metering Provider* is to manage security services for each specified *metering installation* in accordance with the *Rules* and *metrology procedure* requirements.

4.31.2 The *Metering Provider* has obligations with respect to the security of *metering installations*. These obligations relate to:

a) Physical Security of the *metering installation*;

b) *Metering installation* locks, seals and notices;

c) IT security of *metering* equipment;

d) *Metering* equipment passwords;

e) *Metering Providers* IT systems and databases;

f) Management of data access; and

g) Management of security equipment.

4.31.3 Clause 7.4.1(b) of the *Rules* requires the *Metering Provider* to be responsible for providing and maintaining security controls of a *metering installation* in accordance with clause 7.8.2 of the *Rules*. Security controls relate to:

a) The selection and use of *metering* equipment (e.g. multi-password level meters);

b) *Metering installation* site security (locks, seals, access etc);

c) Protection of calibration in the *meter*; and

d) Protection of internal *energy data* in the *meter*.

4.31.4 The *Metering Provider* must carry out all security obligations as required and requested by the *responsible person* and *AEMO*.

4.32 Rights of Access to Data

4.32.1 The *Metering Provider* must facilitate access to the *metering installation* in accordance with clause 7.7 of the *Rules.*

4.32.2 Note: Notwithstanding rights of access to data, the *responsible person* will be the final authority to allow physical access to the *meter* beyond those controlled by the *Metering Provider* and the *Metering Data Provider*.

4.33 Metering Installation Security

4.33.1 Revenue Protection issues

a) The *Metering Provider* shall not remove an asset if there is evidence of tampering or electricity theft. The *Metering Provider* must inform the existing *Metering Provider* and/or *responsible person*, and the *metering installation* shall remain as is until the *responsible person* has investigated. The new *metering* equipment can only be installed once the *responsible person* has given permission.

4.34 Safety

4.34.1 *Metering Providers* must maintain appropriate levels of OH&S policies according to jurisdictional and legislative requirements. Minimum requirements include the

identification of risks and hazards and application of control measures prior to any work being performed on site.

4.34.2 It is expected that relevant site safety information is openly shared amongst Metering Provision businesses, including the dispatch of safety alerts where applicable.

4.34.3 The *Metering Provider* must satisfy / perform any site induction requirements as required by the customer.

4.35 Work Standards

4.35.1 The *Metering Provider* must comply with the *Rules* and all relevant procedures under the *Rules* and the current:

a) AS3000 Wiring Rules;

b) ACA Communications Cabling requirements (where applicable); and

c) jurisdictional and *Network Service Provider* requirements.

4.35.2 In circumstances where the *Metering Provider* identifies an installation that does not comply with clause 4.35.1 of this procedure, it is expected that the *Metering Provider* will inform the *responsible person*, appropriate jurisdictional administrator and/or the NSP (as appropriate).

4.36 Embedded Networks

4.36.1 The *Metering Provider* must provide embedded network functionality where required as defined in the *Rules* and authorised procedures under the *Rules*.

4.37 Time Synchronisation

4.37.1 The *Metering Provider* when installing, testing and maintaining the *metering installation* must ensure the time setting of the *metering installation* is referenced to *Eastern Standard Time* in accordance with clause 7.12 and S7.2 of the *Rules*.

4.37.2 The *Metering Provider* must provide passwords to the *Metering Data Provider* as required by clause 7.8.2 (j) of the *Rules*.

4.38 Audits

4.38.1 The *Metering Provider* must undertake all services in a manner that is auditable by *AEMO.*

4.38.2 *AEMO* will carry out periodic random audits of *metering installations* in accordance with clause 7.6.3 (d) of the *Rules*. These audits are conducted by *AEMO* appointed auditors which are currently undertaken on an annual basis.

4.38.3 The *Metering Provider* must undertake to provide all reasonable assistance to *AEMO* in discharging its obligations under the *Rules* in relation to *metering installations*, including co-operating with and providing assistance to *AEMO* when *AEMO* periodically reviews each *metering installation* and the qualifications of each *Metering Provider*.

4.38.4 *AEMO* will undertake periodic review certification, to a negative assurance level of the *Metering Provider's* system, process and procedures to assess the *Metering Provider's* compliance to the *Rules*, Procedures under the *Rules*, this *service level procedure* and implementation of any approved Metering Asset Management Plan.

4.38.5 All scheduled reviews will be through a centralised review process established by *AEMO* and will be undertaken at the *Metering Provider's* own costs.

4.38.6 Where a review is conducted under this *service level procedure*, the *Metering Provider* must, at its own cost, provide all reasonable assistance including making databases, equipment and premises available for inspection, making personnel available for questioning, and providing copies of any data or information as requested.

4.38.7 Scheduled reviews of the *Metering Provider's* system will be as follows:

a) The first audit to be nominally 24 months after accreditation at a time that suitably coincides with *AEMO's* market audit report.

b) Further and subsequent audits are to be every 24 months and at a time that suitably coincides with *AEMO's* market audit report, or

c) At *AEMO's* direction based on previous satisfactory audit reviews.

4.38.8 The *Metering Provider* is required to establish with *AEMO* the *business days* for audit reviews in advance. A minimum of 15 *business days* notice will be given to the *Metering Provider* for the provision of any specific data requests as part of the audit.

4.39 Non Compliance and Deregistration

4.39.1 The 'Service Provider Compliance Assessment and Deregistration Procedure' (established under clause 7.4.3 (a) of the *Rules*) shall be used by *AEMO* to assess a non-conformance or breach by a *Metering Provider.*

4.39.2 Subject to the assessed breach level as defined within the 'Service Provider Compliance Assessment and Deregistration Procedure', actions that may be taken by *AEMO* in the event that the *Metering Provider* has failed to take corrective action, includes:

a) Loss of accreditation of the *Metering Provider;*

b) Deregistration from categories of accreditation;

c) Suspension from operation in the *National Electricity Market*;

d) Other applied limitation or level of restriction; or

e) Any combination of the above.

5. ATTACHMENT 1 – EXAMPLE FORMS

Meter Read and Meter Change Sheet

						Work Order No			
						Date Issued			
Site Details						NMI			
Address									
Suburb / Locality						Postcode			
Contact						Phone			
Contestable		Comms.type				Program ID			
LNSP		Retailer		MP		MDP			
GPS (if changed)	S				E				
Read Reason									

Meter(s) Read Details Only

I/R	Time	Meter / Relay Serial No	MP (Name Plate)	Register ID	Reading	Multiplier	Dials	Equipment Type	Face Read

Electronic Meter - Removed / Read		Meter Read Only		Meter removed			
Meter No		Multiplier		Meter Type			
CT Ratio		VT Ratio		Meter Provider			
Face Read		Time		MDP/ Profile Read Completed			

Register Number	Reading	Dials	Register Number	Reading	Dials	Register Number	Reading	Dials

Comments					
Completed By		Date		Network Notified	

LV Metering Installation Sheet

		Work Order No	
		Date Issued	
Site Details		NMI	
Address			
Suburb / Locality		Postcode	
Contact		Phone	
Site Warnings			
Meter Position			

PRE CHECKS	Asbestos Panel /Switchboard		All Equipment Sealed	
	Meters pulsing / rotating in correct direction		Existing Seal No	
	Phase Sequence Correct		Links in Operating Position	

Meter Information		Meter No	
Manufacturer		Current Rating (ie 5-15amp)	
Model		Voltage Rating	
Manufacturers Cat. No.		Meter Ke	
Program		Baud Rate	
Meter Point		Feeder Number	
Date & Time Correct on Meter & PC		Meter Multiplier	
B			

Current Transformer Details

Phase	Serial No	Make	Series	Type	Class	Burden	Ratio	Available Ratios	Polarity
A									
B									
C									

Ancillary Equipment Details

Equipment	Asset No	Manufacturer	Comms Medium	MV90 Dial Number	
				EPR zone	
				Read Type	

General Checks			
Phase Sequence at Testblock		Instrument Set User Name	
Meters pulsing/rotating in correct direction		Calibration Date dd/mm/yyyy	
Correct volts with current (visual)		S2 Connected to Neutral Earth	
Phase out voltage mains to		Equipment Earthed	
CT Star Connected		Check potential fuses fitted	
Phase Sequence at Meter		Weather Exposure	
Drawing Number		CT's located in Main Switchboard	

Comments

Completed By		Date	

LV Metering Commissioning Sheet

Work Order No	
Date Issued	
NMI	

Burden Measurements

Rated Burden Ohms or VA		Ratio			Secondary Current	Secondary Voltage	Measured Burden		
		Meter Multiplier					Ohms	V/A	Alternate
Cable Size		Cable Route (Mtrs)		A					
Max Route len				B					
				C					

Test Instruments

General Checks

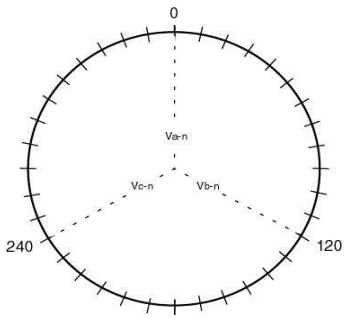
Calibration Date				Drawing No			
	Correct	**Phase Sequence at Testblock**			Correct	**Phase Sequence at Meter**	
	Incorrect				Incorrect		
	Yes	No	**CT Secondary Star Connected**		Yes	No	**S2 Connected to Neutral Earth**
	CT Polarity (P1 Line Side)				**Check correct volts with current (visual)**		
	Yes	No	B Phase voltage connected to earth. If "yes", Check B phase solid link in fuse carrier				
	Check connections tight		Check fuses as 10 amp		All equipment covered & sealed		
	Equipment Earthed		Check meters pulsing/rotating in correct direction				
Meter Date & Time			Actual Date & Time				
A phase potential coil only connected		@					
B phase potential coil only connected		@					
C phase potential coil only connected		@					

Current Transformer Ratio Check

Phase	Primary	Secondary	K = Prim / sec	Nominal K	Angle / P.F (sec)	% Error
A						
B						
C						

Current / Voltage Phase Angle

Phase	Ia			3 Phase Vector Diagram
	Voltage	angle	lead / lag	
A - n				
B - n				
C - n				
A - B				
Phase	Ib			
	Voltage	angle	lead / lag	
B - n				
B - C				
Phase	Ic			
	Voltage	angle	lead / lag	
C - n				
C - A				



kWh Test		Start Time		Start Read		Stop Time		Stop Read	
Energy value		MDP Energy Value		% Difference					

Final Checks

Links returned to operating positions		All connections tight	
Equipment covered and sealed		Site left operationally Safe & Clean	
Seal No		Wire Type		Seal Type	

Equipment Installed

Meter		Comms Unit		Fuses	
Test Block		Sharing Unit		Isolation Unit	
Antenna Type		Active / Neutral Links		Pulse Output	
Mini Gateway		Current Transformers		MFTC	

Details of work carried out

Validation Details / Comments /"Other" Please define

Completed By		Date	

HV Metering Installation Sheet

		Work Order No	
		Date Issued	
Site Details		NMI	
Address			
Suburb / Locality		Postcode	
Contact		Phone	
Site Warnings			
Meter Position			

Install / Alteration		Maintenance		Commission		Breakdown		Meter Change			
Pre Checks	Risk assessment of site carried out		Links in position		Equipment sealed						
	Meters pulsing/rotating in correct direction & consumption registering				Seal No						

Meter Information		Meter No	
Manufacturer		Current Rating (ie 5-15amp)	
Model		Voltage Rating	
Manufacturers Cat. No.		Ke (watt hrs / pulse)	
Program ID		Baud Rate	

Current Transformer Information

Phase	Serial No	Make	Series	Type	Class	Burden	Ratio	Available Ratios
B								
A								
C								

Voltage Transformer Information

Phase	Serial No	Make	Series	Type	Class	Burden	Ratio	Nominal K
A								
B								
C								

Communications Equipment

Equipment	Asset No	Manufacturer	Model / Type	Phone Number	
Phone					
Modem				EPR zone	
Isolation					
Sharing Unit					

Comments			
Completed By		Date	

HV Metering Commissioning Sheet

Work Order No	
Date Issued	
NMI	

Burden Measurements CT

Rated Burden Ohms or VA		Ratio		Secondary Current		Secondary Voltage	Measured Burden	
		Meter Multiplier					Ohms	VA
Cable Size		Cable Route (Mtrs)		A				
Max Route len				B				
				C				

Burden Measurements VT

Rated Burden VA or Siemens		Ratio		Secondary Current		Secondary Voltage	Measured Burden	
		Meter Multiplier					mS	
Cable Size		Cable Route (Mtrs)		A				
Max Route len				B				
				C				

Test Instruments

General Checks

Calibration Date		Drawing No	

Voltage Transformer

	Correct	If circuit is under load, check that the secondary voltage is appropriate for the voltage rating of the Revenue Meter.		Check connections tight
	Incorrect			Equipment Earthed
	Correct	Phase and Polarity Check - Polarity mark on all VTs are following the same convention as the CT's. (i.e., all facing the source).		Check fuses
	Incorrect			All equipment covered & sealed
	Correct	Ratio Check - VT ratio matches the nameplate ratio and that the secondary connection is appropriate for the application.		Check meters pulsing/rotating in correct direction
	Incorrect			

Current Transformer

	Correct	**Phase Sequence at Testblock**		Correct	**Phase Sequence at Meter**		
	Incorrect			Incorrect			
	Yes	No	**CT Secondary Star Connected**		Yes	No	**S2 Connected to Neutral Earth**
	CT Polarity (P1 Line Side)				**Check correct volts with current (visual)**		
	Yes	No	B Phase voltage connected to earth. If "yes", Check B phase solid link in fuse carrier				
	Check connections tight				All equipment covered & sealed		
	Equipment earthed				Check meters pulsing/rotating in correct direction		

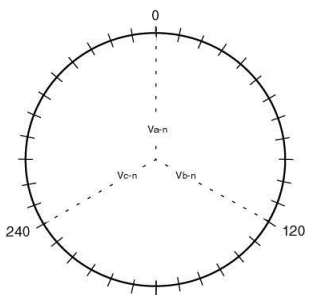
Meter Date & Time		Actual Date & Time	

Current Transformer Ratio Check

Phase	Primary	Secondary	K = Prim / sec	Nominal K	Angle / P.F.(sec)	% Error (+/- 10% acceptable)
A						
B						
C						

Current / Voltage Phase Angle

Phase	Ia			3 Phase Vector Diagram
	Voltage	angle	lead / lag	
A - B				
A - n				
Phase	Ib			
	Voltage	angle	lead / lag	
B - C				
B - n				
Phase	Ic			
	Voltage	angle	lead / lag	
C - B				
C - n				



Completed By		Date	