



Competitive Metering Industry Group

Code for safe installation of type 4 whole current electricity metering in the National Electricity Market

Final Draft: September 2017

Preface

The Council of Australia Governments (COAG) Energy Council have agreed to substantial reforms under the Power of Choice Review and have begun the process of transforming metering frameworks in Australia. The COAG reforms sought to amend the National Electricity Rules (NER) to introduce a framework that provides for competition in metering and related services for residential and small business consumers. The amendments to the NER also require advanced meters to be installed in certain situations such as new connections, refurbishments and replacements.

The competitive metering framework is designed to promote innovation and lead to investment in advanced meters that deliver services valued by consumers at the best price. Improved access to the services enabled by advanced meters will provide consumers with opportunities to better understand and take control of their electricity consumption and the costs associated with their usage decisions.

To allow the successful implementation of the competitive reform, the competitive metering industry is seeking to proactively align to develop the underlying standards and work practices required to deliver a consistent and safe installation. Additionally it is expected this will assist the reform to roll out in a manner that sees energy consumers continue to enjoy accurate and safe metering outcomes with a minimum of disruption and cost.

This code has been prepared by Competitive Metering Industry Group (CMIG) whose members are committed to establishing safe practices for the installation of metering equipment in the NEM.

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1 Introduction

As Australia's energy infrastructure and technology changes with the evolving market and innovation, it is essential that high standards of meter safety and reliability are provided to consumers. The purpose of this Code is to provide a consistent approach to ensure that a customers' electrical metering installation, as defined in clause 2.10, is safe during and after the installation of an advanced meter.

This code also seeks to promote a consistent, national approach to safe metering installation and maintenance is the best way to ensure consumers receive the most effective services and that metering businesses operating across state boundaries can operate with consistency and efficiency.

1.1 Scope

This document identifies the minimum requirements for safe installation of whole current electricity metering in the National Electricity Market (NEM).

The Meter Provider's area of responsibility is to ensure all electrical work conducted;

- Complies with relevant electrical and work place health and safety regulations and local jurisdictional requirements.
- Complies with relevant standards (such as AS3000).
- Does not make the electrical installation unsafe.

1.2 Objective

The objective of this code is to ensure whenever low voltage whole current Type 4 electricity meters are installed (new connections or replacements), the competitive metering industry consistently applies a minimum set of tests and work practices to ensure the metering electrical installation is safe.

1.3 Definitions

Any terms used within this document are consistent with the definitions in the National Electricity Rules.

1.4 Regulatory context

This code sets out the minimum requirements for metering providers who provide, install or replace advanced meters in the NEM. The minimum requirements are intended to align the legislative safety requirements of each NEM jurisdiction which are taken to be as per those listed in appendix 4.1:

1.5 Signatories to this Code

AEMO Accredited Meter Providers that are signatory parties to this Code are compliant with and agree to adhere to the Code.

They are committed to developing and conducting their business in line with best industry practices and ensuring the highest levels of electrical safety are maintained while interacting with consumers in a professional and ethical manner.

A regularly updated list of current signatories to the Code is available online at <https://competitivemetering.com.au/>.

2 Rules and Standards

2.1 General requirements

A metering provider must:

- Establish policies, systems and procedures that enable efficient and effective monitoring of compliance with the requirements identified within this code.
- Regularly review those policies, systems and procedures to ensure they continue to comply with the objectives of this code.
- Maintain a compliance monitoring regime to ensure field work practices conform with the procedures designed to ensure compliance with this code.

2.2 Training and supervision

Meter Providers must describe the training, assessments and record keeping that is being carried out to ensure and demonstrate competency of each person engaged to carry out work (including supervision of apprentices) for installation of advanced meters within that jurisdiction.

A metering provider must have installing electricians (or supervising installing electricians) with acceptable competencies equivalent to the competencies required under the *'National Quality Framework, UEENEEG171A install, setup and commission interval metering'*.

As a minimum, the following competencies are required:

- Electrical license
- WorkCover Occupational Health and Safety General Induction for Construction Work
- Low Voltage Release and Rescue Training
- CPR Training
- Asbestos Awareness Training
- Safe Approach

It is recognized that the rules pertaining to supervision can and do vary dependent on the qualifications of the person/s being trained as well as there being jurisdictional requirements. For the purpose of this code signatories agree to provide close and constant supervision for all persons being trained.

2.3 Tools and equipment

Tools and equipment must be suitable for the work, in good working order and be maintained, tested and inspected in accordance with manufacturer's instructions. Additionally all testing equipment must be calibrated and tested in line with the NER requirements for *"programming and certification requirements for metering installations to the required accuracy"* which states that *"all reference/calibration equipment for the purpose of meeting test or inspection obligations must be tested to ensure full traceability to test certificates issued by a NATA accredited National Electricity Amendment (Expanding competition in metering and related services) Rule 2015 No. 12 (Schedule 3) – marked up 8.12.2015 83 body or a body recognised by NATA under the International Laboratory Accreditation Corporation (ILAC) mutual recognition scheme and documentation of the traceability must be provided to AEMO on request"*

The following provide the minimum requirements to be used:

- *AS4836: Safe working on or near electrical installations and equipment*
- *AS 4741 – testing of connections to LV networks*

2.4 Personal protective equipment

When working on or around the meter location, the person installing the meter must use appropriate personal protective equipment (PPE) for the work being performed and the environment in which that work is performed.

AS/NZS 4836 provides the minimum standard to be used.

2.5 Electrical testing

A Meter Provider must maintain appropriate testing and recording procedures when installing, maintaining or replacing an electricity meter, in accordance with:

- The relevant jurisdictions electrical safety legislation
- AS/NZS 3000; and
- AS4741 Testing of connections to low voltage electricity networks'

Testing may require the presence of power and in all cases, the equipment being tested must be treated as live until proven otherwise.

Testing activities must require the use of:

- correctly rated test equipment, and
- personal protective equipment (PPE) in accordance with conditions of working live.

2.6 New Connections

When a meter is being installed at a new connection the meter provider must confirm that the electrical installation and connection to the network has been tested and fully complies with all applicable standards and requirements prior to making the site available for initial energization. This may be achieved by siting test and inspection records provided by suitably qualified representatives of the customer and network service provider.

For all new connections, the meter provider will leave the site main switch/s isolated and install a warning tape that clearly advises the responsibilities of any person/s energizing the site.

[include example of warning tape]

2.7 Replacement Metering

When a meter is being installed at a replacement connection the meter provider must undertake all works with consideration of the following clauses.

2.8 Pre-establishment of a work area

Prior to approaching a metering installation and as a prerequisite of carrying out metering work, the Meter Provider must ensure the installer carries out a hazard assessment and implements appropriate controls to ensure:

- the area around the main switchboard is accessible and clear of obstructions;
- that any metal enclosure is safe to touch;

- protection of the work site from customer entry;
- correct site identification; and
- checked for life support customers.
- in installations where the property was likely to have had ACM's removed, that MP's treat any debris as a potential ACM and act accordingly.

2.9 Electrical Safety (Duty of Care)

Meter Providers recognize that beyond the safety of their workers they have a 'duty of care' for the electrical safety of both the premises and its occupants beyond the confines of the meter installation, however there are limits to the extent to which that a metering provider can reasonably extend inspections due to the nature of their works being limited to the switchboard and in some cases only the meter box. Furthermore, if and when defective installations are identified the specific actions required to then also rectify any defect/s are routinely limited by the fact that there is no contractual agreement between the meter provider and the customer; as a result the customer is not obligated to undertake any required corrective actions with the metering provider.

To this end the metering provider will ensure the following 'duty of care' actions are the minimum exercised during any meter installation:

- Visual inspection and work practices as covered under section 2.8
- Electrical testing as covered under section 2.5

If and when an installation is found to be defective the metering provider will provide notification to all parties. Appendix 4.2 "Digital Meter Installation Defect Report" form is provided as a guide and is available for use by members.

If and when a defect presents a real safety issue the meter provider will not leave until the site is considered safe for all concerned.

2.10 Visual Inspection and Work Practices

When carrying out work on the meter installation the meter provider will consider the following zones;

Zone 1 (Work Zone) – Includes the components of the installation within and including the upstream point of isolation (generally being the 'service fuse') and the downstream point/s of isolation (generally being the site main switch/s).

Zone 2 – Includes the following components of the installation outside of the 'work zone' that are included for safety purposes:-

- Incoming Overhead Mains Supply Cable
- Customer Point of Attachment
- Overhead Line Connection Box
- Customer Main Switchboard, where accessible
- Main Earth Electrode & Conductor, where accessible

When carrying out work on the meter installation the meter provider will include both zone 1 & 2 components of the installation within a visual inspection:-

The following forms the minimum points that will be covered in the inspection:-

- Basic Protection
- Current carrying capacity of consumer mains (Considering overload protection installed)
- Isolation devices (main switches)
- Connecting devices, e.g. neutral bars, earth bars and active links.
- Switchboard - Identification and labelling
- MEN connection
- Earth electrode
- Earthing conductors, e.g. size, identification

Additionally, the meter provider will ensure:

- The neutral conductors are left in a state such that they can be identified in a manner consistent with AS3000.
- All connections that are disturbed as a result of the metering works are confirmed to be tight consistent with the Electrical Connection section of AS3000.
- That any signs of tampering with the existing installation are reported.

2.11 Testing prior to isolation

Prior to isolation and as a prerequisite to carrying out any metering work, the meter provider shall ensure key electrical characteristics are checked including the following:

- identification of isolation points
- required pre-testing with supply still connected for:
 - i. safe to approach tests to confirm the equipment is safe to proceed to work on;
 - ii. conformation of correct site polarity, polarity can be confirmed as part of other testing i.e neutral integrity testing if undertaken;
 - iii. multiphase installations confirmation and recording of Phase Sequence as seen by customer – to which the installation will be returned at the conclusion of the metering installation work.

Meter Providers should reference the current version of the [VESI Installation Supply Connection Tests & Procedures – Section 3 Test Procedures for conducting any required testing](#).

2.12 Isolation

The Meter Providers procedures must describe acceptable methods of isolation and securing of that isolation, addressing factors such as:

- isolation of the customer load at the main switch/s downstream of the meter.
- extracting any fuse or fuse/link carrier from its base to effect the isolation.
- closing of the cover or remove the fuse/link from the carrier and reinsert carrier into the base to effect the screening any exposed incoming live electrical conductor.
- carrying out testing to confirm electricity supply is de-energised.
- securing the worksite at all isolation points.

In circumstances where isolation cannot be effected, such as service fuses located on power poles, working at heights or the absence of service fuses the installer is to default to the meter providers prescribed safe working practices.

2.13 Energisation

A Meter Provider must ensure that upon energisation:

- a) The tests described in AS4741 are carried out, including;
 - polarity test
 - neutral integrity test
 - phase rotation test
- b) that an effective earth exists for the installation, where the main earth electrode and conductor are accessible that they are in good condition and that all reasonable endeavors are used to verify their effectiveness;
- c) electrical test certificates are issued per jurisdictional requirements; and
- d) prior to departing a site that has been left on supply, additional steps are to be taken to confirm that no dangerous voltages are present on exposed metal or conductors at the meter position and that no hazards remain that could negatively impact consumer safety.

Meter Providers will reference VESI Installation Supply Connection Tests & Procedures – Section 3 Test Procedures for conducting any required testing.

2.14 Dangerous situations found within the installation

When the application of the inspections, tests and procedures in this code result in observing defects or identifying the electrical installation as a hazard, corrective action to make the installation safe will immediately be taken

Dangerous defects include:

- any exposure of live parts (except those exposed during the carrying out of work which can be reinstated at the completion of the work).
- incorrect polarity.
- risk of short circuiting.
- immediate risk of an ignition point.
- compromised earthing or neutral integrity through open (or risk of open) circuits.

A safety management system must provide that personnel who find a dangerous defect are obliged to remove any immediate threat and/or dangerous situation by appropriate means. This may include:

- rectification of the defect on behalf of the customer and/or retailer to an agreed value;
- temporary remediation of the defect on behalf of the customer and/or retailer, thereby allowing the customer time to seek quotes for permanent rectification; and
- as a last resort, disconnection of part or whole of an electrical installation.

A safety management system must include mechanisms to prevent unscrupulous or predatory behaviour in dealing with dangerous defects.

Metering providers shall inform parties affected by defects (see clause 2.17) and in situations in which a defect potentially makes a site unsafe or could potentially cause harm, metering providers have the

obligation to make the site safe (including controlling isolation of the site if deemed necessary).

2.15 Asbestos management

The Meter Provider must provide clear instructions on the following requirements for identifying and working with and around asbestos containing material (ACM):

- a) asbestos identification.
- b) preparation for asbestos handling.
- c) performing asbestos work.
- d) contaminated waste disposal.

2.16 Auditing regime

The Meter Provider must have an audit regime to determine compliance with the requirements of that system and other regulatory requirements.

An audit regime must:

- be documented.
- keep evidence of inspections and results of those inspections.
- keep a record of any associated actions, including process improvements.

2.17 Defect reporting obligation

Meter Provider must report uncorrected identified hazards and compliance issues to the Retailer (FRMP), Network (LNSP), Meter Coordinator (MC), jurisdictional electrical safety regulator and customer.

3 Code Administration and Compliance

Signatories to this Code are also subject to the Code administration and compliance arrangements as set out below.

3.1. Role of the Code Administrator

- 3.1.1 [Appointment of an appropriate code administrator and the mechanism for administration is still being considered by CMIG. This section will be updated prior to final publication.]
- 3.1.2 The Code Administrator will be responsible for:
- (a) managing the administration process relating to Code signatories;
 - (b) monitoring Code compliance, including:
 - i. carrying out compliance audits and initiating inquiries into compliance; and
 - ii. investigating complaints that the Code has been breached;
 - (c) determining when breaches of the Code have occurred;
 - (d) determining appropriate action when breaches of the Code have occurred;
 - (e) enforcing sanctions;
 - (f) referring cases to the Code Review Panel for consideration as required;
- 3.1.3 The Code Administrator is not a dispute resolution body and will refer consumers to either the Code Signatory or the relevant consumer protection organisation in accordance with section 3.2 below.

3.2. Compliance and Auditing

- 3.3.1 CMIG members have agreed the points contained in a compliance checklist form to be completed as part of undertaking metering works by Signatories', the checklist points are to be recorded by Signatories' for monitoring compliance with the Code to ensure it delivers the desired outcomes. Signatories must agree to comply with the requirement for regular monitoring and to allow audits on their compliance with the Code.
- 3.3.2 The Code Administrator will carry out monitoring and auditing measures and assess ongoing compliance with the code through audits of the compliance checklists undertaken as part of their audits of MP accreditation.
- 3.3.3 A list of the agreed checklist points are contained in the form "Site Compliance – Checklist" (Appendix 4.3) which is available for use by signatories for use as is or for incorporation within an in-house document.

3.3. Review of Code

3.4.1 The content of the code is administered by CMIG using a safe work sub group which is convened as follows to review and update this code:

- (a) at least every 5 years; or
- (b) at a special meeting of the sub group if it is determined that a review is required.

4 Appendices

- 4.1 Jurisdictional Safety Legislation
- 4.2 Form - Digital Meter Installation Defect Report
- 4.3 Form - Site Compliance Checklist

Jurisdictional Safety Legislation

Queensland

- Electricity—National Scheme (Queensland) Act 1997 and Electricity—National Scheme(Queensland) Regulation 2014 are jurisdictional amendments to the National Electricity Rules and Procedures
- National Energy Retail Law (Queensland) Act 2014 and National Energy Retail Law (Queensland) Regulation 2014 are jurisdictional amendments to the National Energy Retail Law that permits card operated meters and provides de-energisation/re-energisation requirements
- Electricity Act 1994 & Electricity Regulation 2006 – are jurisdictional requirements for operating in Queensland, which includes load control
- Electrical Safety Act 2002 & Electrical Safety Regulation 2013 requires modification to allow remote disconnect and re-connection as a visual inspection is required before re-connection.
- Work Health and Safety Act 2011 & Work Health and Safety Regulation 2011 outlines the requirements for safety notification and restrictions (such as asbestos)
- Electrical safety code of practice 2013 outlines the management of electrical risks in the workplace, prohibition of energised work unless absolutely necessary with the assistance of a safety observer
- Queensland Electricity Connection and Metering Manual Ver 11 outlines the metering installation requirements.

New South Wales

- a) Work Health and Safety Act 2011 and Work Health and Safety Regulation 2011 which require a safe system of work. The WHS regime also has specific requirements that deal with electrical work on energised electrical equipment (in Division 4 Part 4.7 of the Work Health and Safety Regulation 2011).
- b) WorkCover code of practice: Managing electrical risks in the workplace (July 2015) which contains detailed requirements to be followed.
- c) Electricity (Consumer Safety) Act 2004 and Electricity (Consumer Safety) Regulation 2015 set out the standards for a person carrying out meter installation work; applies the Australia/New Zealand Wiring Rules as the standard; allows only a qualified person to carry out a safety and compliance test after completion of the work, in accordance with those Wiring Rules.
- d) Home Building Act 1989 and Home Building Regulation 2014 which ensures that the carrying out of electrical wiring work (including meter installations) is within the licensing framework for electrical wiring work and prohibits persons doing this work who are not qualified persons or as otherwise prescribed by that Act.
- e) National Electricity Rules and procedures, which contain requirements to ensure accuracy of meters for the national electricity wholesale market.
- f) Metrology Procedure, which set out the requirements that must be demonstrated by a metering provider to be accredited for a particular type of meter.
- g) Service and Installation Rules of NSW, which ensure that any person doing metering work is required to carry out the work in accordance with connection requirements of distributors.

Victoria

- Occupational Health and Safety Act 2004;
- Occupational Health and Safety Regulation 2007,
- Electricity Safety Act 1998
- Electricity Safety (Installations) Regulations 2009
- Electricity Safety (Registration and Licensing) Regulations which ensures that the carrying out of electrical wiring work (including meter installations) is within the licensing framework for electrical wiring work and prohibits persons doing this work who are not qualified persons or as otherwise prescribed by the Electricity Safety Act.
- Electricity Safety (Management) Regulations which identify the requirements for Voluntary Electrical Safety Management Systems
- National Electricity Rules and procedures, which contain requirements for meter Provider Businesses (MPB's) to ensure accuracy of meters for the national electricity wholesale market (NEM).
- Metrology Procedure, which set out the requirements that must be demonstrated by a metering provider to be accredited for a particular type of meter.
- Service and Installation Rules of Victoria, which ensure that any person performing metering work is required to carry out the work in accordance with connection requirements of distributors.

South Australia

- Electricity Act 1996, The *Electricity Act 1996* provides the Office of the Technical Regulator with the authority to enforce the requirements of the legislation and its associated regulations.
- Electricity (General) Regulations 2012, defines legal safety and technical requirements
- Work Health and Safety Regulations 2012
- Trade Practices Act 1974
- Plumbers, Gas Fitters and Electricians Act 1995,
- SA Power Networks Service and Installation Rules 2016, incorporate the “Technical Installation Rules” referred to in regulation 76 of the Electricity (General) Regulations 2012 under the Electricity Act 1996.

Tasmania

- Electricity Supply Industry Act 1995
- Occupational Licensing Act 2005
- Electricity Industry Safety and Administration Act 1997
- Occupational Licensing Act 2005
- Tasmanian Electricity Code 2005
- Work Health and Safety Act 2012
- Codes of practice 2016
- Service Installation Rules Manual (Tasnetworks document) is a guide.

Australian Capital Territory

- Work Health and Safety Regulation 2011
- Utilities (Electricity Restrictions) Regulation 2004
- Service & Installation Rules (Actew AGL document)
- Electrical Safety Rules (The Blue Book)
- Utilities Act 2000

Customer Name:

Site Address:

Meter Serial Number/s: NMI:

Supply Overhead Underground No. of Phases

While attending the above site to replace/inspect the electricity meter, the attending metering technician noted that the electrical installation does not comply with relevant regulations (Defect)

The Defect must be rectified by a suitably qualified person and where required the appropriate Certificate of Electrical Safety issued, as required by the relevant jurisdictional regulations. Notification of this Safety Advice has been provided to the appropriate Local Electrical Safety Authority, which may lead to disconnection or isolation by this Authority if the Defect is not rectified.

Defect Matrix			Defect Type																		
Level	Category	Description	Minor Defect/Damage	Non-Compliant Customer Wiring	Moderate Defect/Damage	Meter is not protected from the weather	No Access to service fuse(s) or isolation device	Asbestos containing material	Major Electrical Installation Defect/Damage	Damaged, Faulty and/or Superseded Wiring	Illegal Wiring – Tampering	Exposed conductive parts	No MEN at customers' installation	Active to neutral loop impedance greater than 1ohm. (NST failure).							
1	Hazardous Unsafe	Immediate threat to health and safety, Electrical Installation is unsafe and is likely to cause electric shock or damage to property.																			
2	Non-Compliant Non-Hazardous	Non-hazardous defect present no immediate health and safety risk but is likely to prevent the meter exchange from occurring.																			
3	Non-Compliant	Customer defect related to maintenance or non-compliant issues that may pose a safety issue and will not prevent the installation of advanced metering.																			
Defect Location																					
A	Zone 1																				
B	Zone 2																				
C	Other:																				

Indicate on the picture the location of the defect, provide additional comment / description as required:

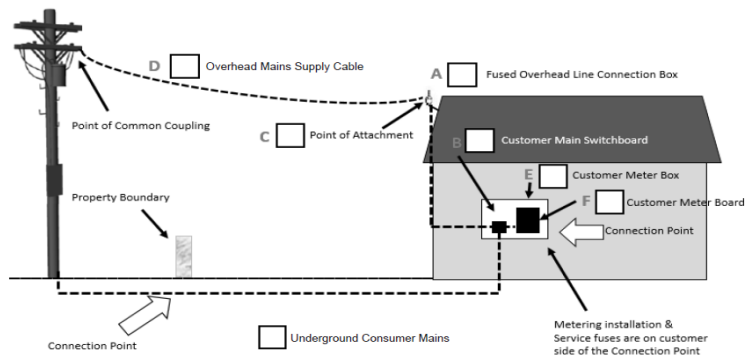
.....

.....

.....

Customer Name

Signature



Name of Meter Technician:

Date:

Once you have corrected the Defect please notify your Energy Retailer

Customer Energy Retailer & Contact Number:

THIS NOTICE REFERS ONLY TO THE 'DEFECT' IN THIS ADVICE AND DOES NOT EXCLUDE THE POSSIBILITY OF OTHER INSTANCES OF NON-COMPLIANCE

Customer / Job Name: Job No.:.....

Site Address:

Meter Serial Number/s: NMI:

Personnel undertaking the works will Tick One Box per Description / Item as indicate given the type of activities being carried out: -

Yes – Legal / Compliance No – Unsatisfactory N/A – Not Applicable

Description / Item	De-energisation	Yes	No	N/A
1.	Controls associated with pre-establishment of work area completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Pre-isolation testing and checks performed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Isolation consistent with requirements of MP undertaking works completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Description / Item	Re-energisation	Yes	No	N/A
4.	Re-energisation testing undertaken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Re-energisation testing passed, if 'no' Dangerous Situations section must be completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Asbestos containing materials and/or debris identified, if 'yes' complete question '7'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Asbestos Management plan implemented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Description / Item	Dangerous Situations	Yes	No	N/A
8.	Digital Meter Defect Report form completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Customer advised of defect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Review / Comments:	Action By

Meter Technician : Name - _____ / Signature: _____ Date: / /

Administration Only

Reviewed By: _____ Date: __ / __ / __

Comments: _____