

Electricity Industry Participation Code Audit Report

For



Class B Approved Test House

Prepared by Steve Woods – Veritek Limited

Date of Audit: 24/01/18

Date Audit Report Complete: 19/02/18

Date Audit Report Due: 19/02/18

Executive Summary

Trustpower is a Class B Approved Test House and this audit was performed at their request, to encompass the Electricity Industry Participation Code (Code) requirement for an audit, in accordance with clause 2 of schedule 10.3.

The Authority has stipulated that the next audit is due by 19 February 2018, in accordance with clause 1(4)(c) of schedule 10.3.

Eight non-compliances were identified by the audit and three recommendations are made. Seven of the eight non compliances relate to the format and content of certification and inspection reports and should be relatively easy to remedy. As shown in the table below, one issue can appear in multiple sections, as is the case with the first four issues, which are all related to the content of the newly created AMI metering installation reports.

The main issue is the certification of 22 three phase installations where only one phase is metered. This certification is invalid and it will require the installation of three phase meters to resolve the non-compliance.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The table below provides some guidance on this matter and recommends a next audit frequency of 12 months. I recommend the Authority considers a longer period of 24 months to reflect that the eight points raised relate to a small number of overall issues. Trustpower intends to have all of the record related issues resolved by 01/03/18, which leaves the metering installations with single phase meters on three phase installations as the only issue where additional time is required.

The matters found are shown in the tables below:

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Metering installation type	3.2	8(2) of Schedule 10.7	Metering installation certification report for AMI deployment does not contain the location of the services access interface, or whether the installation is HHR or NHH.	Moderate	Low	2	Identified
Services access interface	3.5	10 of Schedule 10.4	Metering installation certification report for AMI deployment does not contain the location of the services access interface.	Moderate	Low	2	Identified

Subject	Section	Clause	Non compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Meter requirements	3.11	26 (4) of Schedule 10.7	Metering installation certification report for AMI deployment does not contain the maximum interrogation cycle.	Moderate	Low	2	Identified
Maximum interrogation cycle	3.14	28 (3) of Schedule 10.7	Metering installation certification report for AMI deployment does not contain the maximum interrogation cycle.	Moderate	Low	2	Identified
Invalid certification	5.1	8(1) Of Schedule 10.7	22 metering installations certified with single phase meters on three phase installations.	Moderate	Low	2	Identified
Certification methods	5.9	7(1) of Schedule 10.7	Comparative method used for certification and should only be used for recertification.	Moderate	Low	2	Identified
Installation expiry dates	5.34	27(1) & (2) Of Schedule 10.7	Installation expiry date later than CT expiry date.	Moderate	Low	2	Identified
Inspection reports	6.3	44(2) Of Schedule 10.7	Inspection report does not record the installation expiry date.	Moderate	Low	2	Identified
Future Risk Rating						16	
Indicative Audit Frequency						12 months	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Remedial Action
Organisation and management	2.7	15 of Schedule 10.4	Clarify the Technical and Quality Manager appointments in the quality manual.	Cleared
Certification reports	3.6	26(1) of Schedule 10.7	Ensure meter certification date, expiry date and certifying ATH is clear in certification reports.	Identified

Subject	Section	Clause	Recommendation for improvement	Remedial Action
Component certification	4.12	5 of Schedule 10.8	<p>Ensure data storage device certification date, expiry date and certifying ATH is clear in certification reports.</p> <p>Ensure all type test reports and calibration reports are in a folder and are easily locatable.</p> <p>Develop a table, including dates, to record the existence of type test reports and that they have been checked and approved</p>	Identified

Persons Involved in This Audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Trustpower personnel assisting in this audit were:

Name	Title
Graeme Prestidge	MEP Manager
Paul Wilson	Metering Services Technical Advisor

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1. ADMINISTRATIVE

1.1 Exemptions from Obligations to Comply with Code (Section 11 of Electricity Industry Act 2010)

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

I checked the Authority's website for any relevant exemptions.

Audit commentary

There are no exemptions in place.

1.2 Scope of Audit

Trustpower is a Class B ATH and this audit was performed at their request, to encompass the Electricity Industry Participation Code requirement for an audit, in accordance with clause 2 of schedule 10.3.

The Authority has stipulated that the next audit was due by 19 February 2018 in accordance with clause 1(4)(c) of schedule 10.3.

The audit was conducted in accordance with the ATH Audit Guidelines V1.2 produced by the Electricity Authority.

Trustpower provides ATH services to metering equipment providers in respect of the installation and/or re-certification of Category 1 to Category 3 metering. Trustpower provides training and also conducts field audits to ensure the on-going compliance and competence of subcontractors.

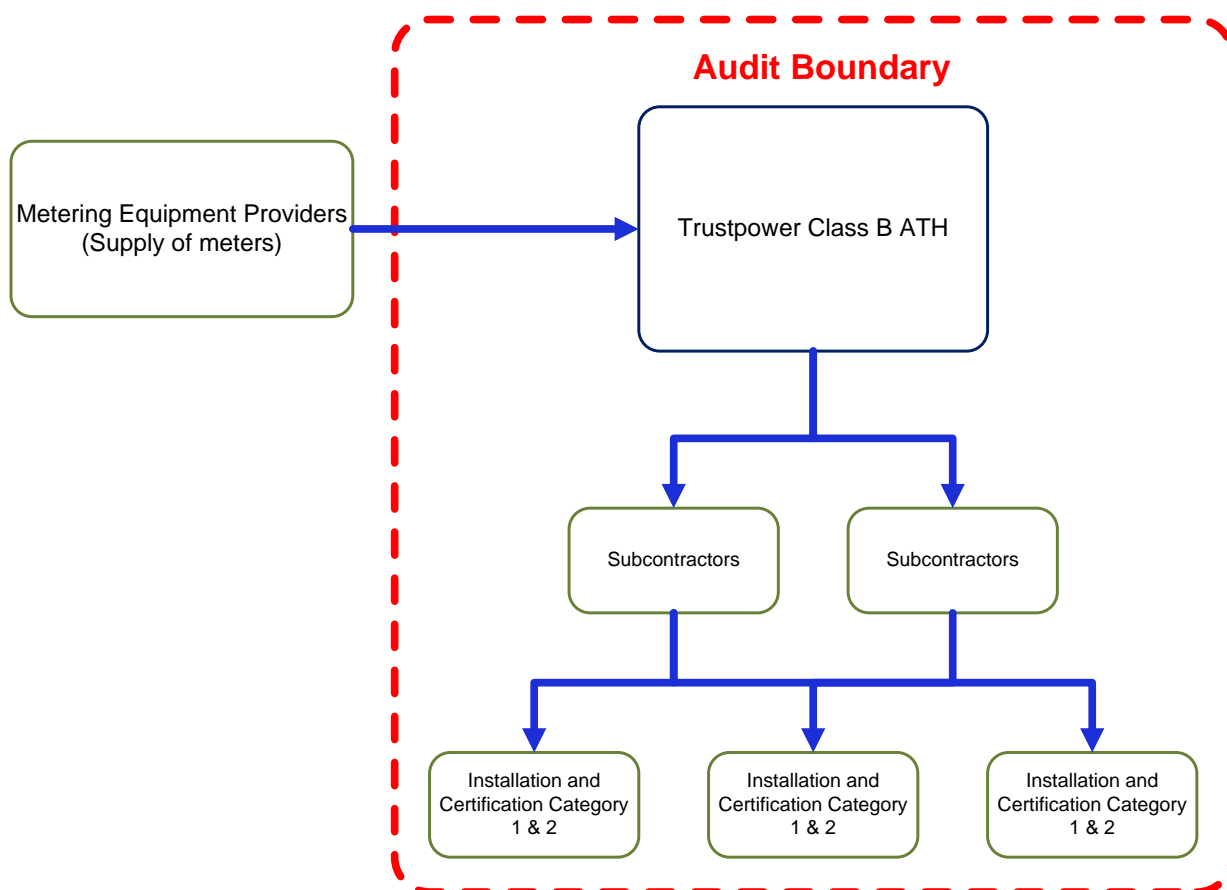
Trustpower wishes its ATH approval to include the following functions of Clause 4(2) of Schedule 10.3:

- (b) installation and modification of metering installations:
- (c) installation and modification of metering components:
- (d) calibration of metering components on site:
- (e) certification, using the selected component certification method, of:
 - (i) category 1 metering installations:
 - (ii) category 2 metering installations:
 - (iii) category 3 metering installations with a primary voltage of less than 1kV:
- (g) certification, using the comparative recertification method, of category 2 metering installations:
- (h) issuing of certification reports in respect of certifications of metering installations under paragraphs (e) to (g):
- (i) inspection of:
 - (i) category 1 metering installations:
 - (ii) category 2 metering installations:
 - (iii) category 3 metering installations with a primary voltage of less than 1kV.

Trustpower also requires approval to certify metering components. I note that neither the Class B or Class A functions listed in Clauses 3(2) and 4(2) of Schedule 10.3 include certification of metering components.

There were no Category 3 metering installations certified during the audit period; however, the relevant processes still exist in the quality manual, and a number of contractors have been trained and deemed competent in this area.

The boundaries of this audit are shown below for greater clarity.



1.3 Previous Audit Results

The last audit was conducted in November 2014 by Steve Woods of Veritek. The tables below show the findings:

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Uncertainty calculations	5.30	12(3)(b) & 22 of schedule 10.7	Trustpower is not calculating the uncertainty per installation, considering all site specific conditions, for example temperature.	Cleared
Components installed by switchboard manufacturers	5.33	25 of schedule 10.7	Trustpower is supplying meters to switchboard manufacturers.	Cleared
Meter component stickers	2.14	8 of schedule 10.8	Component stickers have not been applied to meters.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Comparative certification	5.9	12 of schedule 10.7	Use the selected component method for certification of new category 2 installations.	Still existing

2. ATH REQUIREMENTS

2.1 Use of Contractors (Clause 10.3 of Part 10)

Code related audit information

A participant may perform its obligations and exercise its rights under this Part by using a contractor. A participant who uses a contractor to perform the participant's obligation under this Part remains responsible and liable for, and is not released from, the obligation, or any other obligation under this Part.

Audit observation

I checked Trustpower understands of this requirement by conducting a walk-through of contractor management processes. I checked the audit regime in place to ensure contractors are competent and are following Trustpower's instructions.

Audit commentary

Trustpower has a number of contractors operating under their ATH. Clause 10.3(c) requires that Trustpower *"must ensure that the contractor has at least the specified level of skill, expertise, experience, or qualification that the participant would be required to have if it were performing the obligation itself."*

Trustpower has over 100 subcontractors operating under their Test House; a register is maintained of these parties and individuals and this was viewed during the audit. Auditing of fieldwork and associated paperwork is conducted on an ongoing basis and there were no issues found which had an impact on billing or reconciliation accuracy. With such a large number of contractors across most of the country, the audit process does not reach each individual. Trustpower has appropriately prioritised their auditing to ensure those who are completing large volumes of work are audited.

The audit process for AMI deployment has a target of 3% to 5% of jobs per contractor, including live audits. These targets are being met. AMI jobs all have photos and 100% of these are checked.

The audit process includes a proportion of live auditing to ensure appropriate practices are adopted. Each contractor receives a report detailing the results of the audits and any recommendations for improvement.

The auditing of contractors engaged in Category 2 activities is conducted through the technical review of all paperwork. Digital photographs are provided for all installations, which enables an additional level of evaluation, including workmanship.

Audit outcome

Compliant

2.2 Provision of Accurate Information (Clause 10.6 of Part 10)

Code related audit information

A participant must take all practicable steps to ensure that information that it provides under this Part is:

- *complete and accurate*
- *not misleading or deceptive*
- *not likely to mislead or deceive.*

If a participant, having provided information under this Part, becomes aware that the participant has not complied with these requirements, the participant must, except if clause 10.43 applies, as soon as practicable provide such further information, or corrected information, as is necessary to ensure that the participant complies.

Audit observation

I checked compliance with this clause at the end of the audit to determine whether compliance had been achieved.

Audit commentary

I did not find any information that was not complete and accurate, or likely to mislead or deceive.

Audit outcome

Compliant

2.3 Dispute Resolution (Clause 10.50(1) to (3) of Part 10)

Code related audit information

Participants must in good faith use best endeavours to resolve any disputes related to Part 10 of the Code. Disputes that are unable to be resolved may be referred to the Authority for determination. Complaints that are not resolved by the parties or the Authority may be referred to the Rulings Panel by the Authority or participant.

Audit observation

I checked whether any disputes had been dealt with by Trustpower during the audit period.

Audit commentary

Trustpower has not needed to resolve any disputes in accordance with these clauses.

Audit outcome

Compliant

2.4 ATH Approval (Clause 10.40 of Part 10)

Code related audit information

A person wishing to be approved as an ATH, or an ATH wishing to renew its approval, must apply to the Authority:

- *at least two months before the intended effective date of the approval or renewal*
- *in writing*
- *in the prescribed form*
- *in accordance with Schedule 10.3.*

A person making an application must satisfy the Authority (providing, where appropriate, suitable evidence) that the person:

- *has the facilities and procedures to reliably meet, for the requested term of the approval, the minimum requirements of this Code for the class or classes of ATH for which it is seeking approval*
- *has had an audit under Schedule 10.3*
- *is a fit and proper person for approval.*

Audit observation

I checked the most recent application for re-certification.

Audit commentary

Trustpower has appropriate approval and appropriate facilities and procedures to meet the minimum requirements of the Code.

Audit outcome

Compliant

2.5 ATH Requirements (Clause 10.41 of Part 10)

Code related audit information

An ATH must, when carrying out activities under this Part:

- *only carry out activities for which it has been approved by the Authority*
- *exercise a degree of skill, diligence, prudence, foresight, and economic management, taking into account the technological complexity of the metering components and metering installations being tested:*
 - *determined by reference to good industry practice*
 - *that would reasonably be expected from a skilled and experienced ATH engaged in the management and operation of an approved ATH*
- *comply with all applicable safety, employment, environmental, and other enactments*
- *exercise any discretion given to it under this Part by:*
 - *taking into account the relevant circumstances of the particular instance*
 - *acting professionally*
- *recording the manner in which it carried out its activities and its reasons for carrying the activities out in that manner.*

Audit observation

I checked policy and process documentation to confirm compliance with these clauses.

Audit commentary

Trustpower has only conducted activities that fall within the scope of their approval. I have concluded from this audit that Trustpower has met the requirements of this clause.

I checked compliance with other enactments, specifically the electricity regulations with regard to safety practices and I confirm the following critical points are managed in a robust manner:

- Access to basic insulation. Meters are supplied with long terminal covers. Other options available to technicians are sleeving conductors or screwing shut enclosures. All installations are left at least in the conditions they were found.
- Liveness practices, specifically polarity testing. Instructions are clear in relation to this and results are recorded in certification records.
- Safety practices with regard to the management of asbestos switchboards. Contractors have their own policy for asbestos switchboards. The Information is in the contractors' health and safety manual with several options.
- General safety practices and the appropriate use and testing of personal protective equipment. Policy and instruction is clear in relation to this. PPE must be worn, including safety glasses.

Audit outcome

Compliant

2.6 Quality Management Systems (Clauses 3(1) & 4(1) of Schedule 10.3)

Code related audit information

An ATH must establish, document, implement, maintain, and comply with a quality management system which records its processes and procedures to ensure compliance with this Part.

An applicant applying for approval or renewal of approval, as a class A ATH must, as part of its application, confirm that it holds and complies with AS/NZS ISO 17025 accreditation, for at least the requested term of the approval.

An applicant applying for approval, or renewal of approval, as a class B ATH must, as part of its application to the Authority, confirm that it holds and complies with AS/NZS ISO 9001:2008 or AS/NZS ISO 9001:2016 certification for at least the requested term of the approval.

Audit observation

I obtained and reviewed the most recent ISO report to confirm the scopes were appropriate and that certification was in place.

Audit commentary

Trustpower provided a copy of their most recent ISO 9001:2008 audit report, dated May 2017, which was conducted by Telarc. The scope of the ISO certification is appropriate for the work undertaken. One major non-conformance was identified, regarding the requirement to update parts of the quality

system to meet the 2015 standard. Four opportunities for improvement were recorded, which are either resolved or under consideration.

Audit outcome

Compliant

2.7 Organisation and Management (Clause 15 of Schedule 10.4)

Code related audit information

An ATH must ensure that it has managerial staff who, unless otherwise permitted in the relevant approval, all have the authority and resources needed to discharge their duties; and the responsibilities, authority, and functional relationships of all its personnel are fully and accurately specified and recorded in the ATH's records.

An ATH must appoint a technical manager (however named) with overall responsibility for technical operations, who must have appropriate engineering qualifications and experience in the operation of an approved ATH; and a quality manager (however named), with responsibility for the quality management certification and the implementation of the quality management system.

Audit observation

I checked records in the quality manual to confirm compliance.

Audit commentary

Paul Wilson is appointed as Technical Manager. Jaime Ottensen is appointed as Quality Manager. Both have appropriate qualifications and experience. I recommend Trustpower includes more specific documentation in the quality manual confirming the Technical and Quality Manager appointments.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 15 of Schedule 10.4	Clarify the Technical and Quality Manager appointments in the quality manual.	Risk and Stakeholder Manager is appointed as quality manager (Annabel Davies)	Cleared

An ATH must ensure that all staff who perform or supervise work or activities regulated under this Part are technically competent, experienced, qualified, and trained for the functions they perform. I checked the training and competency assessment processes and I confirm compliance with this clause.

Audit outcome

Compliant

2.8 Document Processes and Procedures (Clause 16 Of Schedule 10.4)

Code related audit information

An ATH must establish, document, implement, maintain, and comply with a quality management system which records its processes and procedures.

Audit observation

I checked the Class B quality documentation and I reviewed the relevant ISO report.

Audit commentary

The quality management system meets the requirements of the Code.

Audit outcome

Compliant

2.9 Quality Standard Required For Field Work (Clause 17 Of Schedule 10.4)

Code related audit information

If a class A ATH arranges for another person to carry out field work, it must ensure that person is certified to the relevant AS/NZS ISO9001:2008 or AS/NZS ISO9001:2016 standard at all times while the person carries out the work.

Audit observation

Trustpower has not required other parties to carry out field work.

Audit commentary

Trustpower has not required other parties to carry out field work.

Audit outcome

Not applicable

2.10 Material Change Requirements (Clause 16A.11)

Code related audit information

If the ATH intends to make a material change to any of its facilities, processes, procedures, or the scope of the ATH's ISO accreditation is reduced, the ATH must arrange for an additional audit at least five business days before the change or reduction in scope take place.

Audit observation

Trustpower has not conducted any material changes.

Audit commentary

Trustpower has not conducted any material changes.

Audit outcome

Not applicable

2.11 Audit Required For ATH Approval (Clause 16A.12 and 16A.13)

Code related audit information

The ATH must provide an audit report to the Authority by the due date. If there are areas where compliance is not achieved, the ATH must also submit a compliance plan which specifies the actions that the ATH intends to address, any issues identified in the audit report and the time frames to complete those actions.

Audit observation

Trustpower is currently undergoing an audit and the report will be provided with a compliance plan.

Audit commentary

Trustpower is currently undergoing an audit and the report will be provided with a compliance plan.

Audit outcome

Compliant

2.12 Accommodation & Environment (Clause 1 of Schedule 10.4)

Code related audit information

An ATH must maintain a list of personnel who are authorised to access and use its laboratory and storage facilities and restrict access to its laboratory and storage facilities to:

- (i) the personnel specified*
- (ii) the Authority*
- (iii) an auditor conducting an audit*
- (iv) any other person who is, at all times, directly supervised by a member of personnel specified.*

Audit observation

Trustpower does not operate a laboratory function because their scope is limited to field installation work.

Audit commentary

Trustpower does not operate a laboratory function because their scope is limited to field installation work.

Audit outcome

Not applicable

2.13 Compensation Factors (Clause 8 of Schedule 10.4)

Code related audit information

If an ATH is approved to certify metering installations, the ATH must have a documented process for the determination of compensation factors.

Audit observation

I checked the documentation in relation to compensation factors and I checked 15 certification reports.

Audit commentary

The documentation achieves compliance with the Code and checks of the certification reports confirmed accuracy.

Audit outcome

Compliant

2.14 Metering Component Stickers (Clause 8(3) of Schedule 10.8)

Code related audit information

An ATH must ensure that a certification sticker is:

- *made of weather-proof material*
- *permanently attached*
- *filled out using permanent markings.*

Audit observation

I checked Trustpower's component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause.

Audit outcome

Compliant

2.15 Interference with Metering Installations (Clause 10.12)

Code related audit information

An ATH may not directly or indirectly interfere with a metering installation unless it is also the MEP or has been instructed to do so by the existing or gaining MEP for the installation.

Audit observation

I audited this clause by exception.

Audit commentary

I did not identify any interference by Trustpower during the audit.

Audit outcome

Compliant

3. METERING RECORDS AND REPORTS

3.1 Physical Location of Metering Installations (Clause 10.35 of Part 10)

Code related audit information

If it is not practical in the circumstances to locate the metering installation at the point of connection, the reconciliation participant must calculate the quantity of electricity conveyed through the point of connection using a loss compensation process approved by the certifying ATH.

If this occurs the ATH must record the calculation, measurements, and assumptions in the installation certification report.

Audit observation

I checked whether Trustpower had certified any installations with loss compensation.

Audit commentary

Trustpower has not been required to conduct any loss compensation calculations.

Audit outcome

Compliant

3.2 Metering Installation Type (Clause 8(2) of Schedule 10.7)

Code related audit information

The metering installation certification report must specify whether the installation is half hour or non-half hour metering. It must also record where the services access interface is.

Audit observation

I checked 22 certification reports to confirm compliance.

Audit commentary

Trustpower's standard metering installation certification reports contain the relevant fields but the newly created certification reports for the AMI deployment do not have a field to record whether the installation is HHR or NHH and they don't have a field for the location of the services access interface.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 8(2) of Schedule 10.7 From: 01-Oct-17 To: 31-Jan-18	Metering installation certification report for AMI deployment does not contain the location of the services access interface, or whether the installation is HHR or NHH. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	Rationale for audit risk rating

Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Field added to metering installation certification report		01/03/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
None (resolved)			

3.3 Record Metering Installation Category (Clause 8(4) Of Schedule 10.7)

Code related audit information

An ATH must record the category of the metering installation in the metering installation certification report.

Audit observation

I checked 22 certification reports to confirm compliance.

Audit commentary

All reports correctly recorded the metering category.

Audit outcome

Compliant

3.4 Calibration Test Points (Clause 7(7) Of Schedule 10.4)

Code related audit information

An ATH may select a test point other than those specified in the relevant standard listed in Table 5 of Schedule 10.1, or at a lower burden than specified in the standard, but must, if it does this, document its reasons for the selection of these test points in the calibration report.

Audit observation

Trustpower does not calibrate components.

Audit commentary

Trustpower does not calibrate components.

Audit outcome

Not applicable

3.5 Services Access Interface (Clause 10 of Schedule 10.4)

Code related audit information

An ATH must, when preparing a metering installation certification report, determine, and record in the certification report, the location of the services access interface. The services access interface means the point, at which access may be gained to the services available from a metering installation, that is:

- recorded in the certification report by the certifying ATH for the metering installation*
- where information received from the metering installation can be made available to another person*
- where signals for services such as remote control of load (but not ripple control) can be injected.*

Audit observation

I checked 22 certification reports to confirm compliance.

Audit commentary

Trustpower's standard metering installation certification reports contain the relevant fields but the newly created certification reports for the AMI deployment do not have a field to record the location of the services access interface.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.5 With: Clause 10 of Schedule 10.4 From: 01-Oct-17 To: 31-Jan-18	Metering installation certification report for AMI deployment does not contain the location of the services access interface. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Field added to metering installation certification report		1/3/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
none			

3.6 Certification & Calibration Reports (Clause 11(1) of Schedule 10.4)

Code related audit information

An ATH must, for each metering installation that it certifies, produce a certification report in accordance with Schedule 10.7. An ATH must, for each metering component:

- that it calibrates, produce a calibration report in accordance with Schedule 10.8*
- that it certifies, produce a certification report in accordance with Schedule 10.8.*

Audit observation

I requested a sample of 22 certification records to confirm compliance.

Audit commentary

Certification reports are produced for all installations. Trustpower does not calibrate components. Component certification records are contained in Maximo and reports can be generated on request. The meter certification and expiry dates are contained in Maximo, but are not always recorded on the certification reports. I recommend these dates are included on all certification reports. The Trustpower ATH certifies non-AMI meters but AMI meters are purchased pre-certified from Landis + Gyr. The certifying ATH is not clear on certification reports or in Maximo. I recommend clarity is improved for this information.

Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Clause 26(1) of Schedule 10.7	Ensure meter certification date, expiry date and certifying ATH is clear in certification reports.	Because cert done by component method, all expiry dates calculated from the commissioning date	Identified

3.7 ATH Record Keeping Requirements (Clause 12 of Schedule 10.4)

Code related audit information

The ATH must document and maintain its record keeping system for certificates, reports, and any other records. The records can be stored in any media, such as hard copy or electronically. The records should be stored in a manner that prevents deterioration or damage and that retrieval of a record cannot result in change or damage to the record. Electronic storage should be backed up.

The ATH must securely store all records, certificates, and reports and ensure that each metering installation is:

- uniquely identified*
- sufficiently detailed to verify the tests carried out including test conditions, the test equipment used and the personnel carrying out the tests.*

Audit observation

I checked the certification records for 22 metering installations along with the storage practices.

Audit commentary

All records were available and records are stored indefinitely.

Audit outcome

Compliant

3.8 Retention of Records (Clause 13 of Schedule 10.4)

Code related audit information

The ATH must keep all records, certificates, and calibration reports for all components and installations certified for at least 48 months after the date of decommissioning.

Audit observation

I checked the certification records for 22 metering installations along with the storage practices.

Audit commentary

All records were available and records are stored indefinitely.

Audit outcome

Compliant

3.9 Advise MEP of Records, Certificates Or Reports For A Metering Installation (Clause 14 Of Schedule 10.4)

Code related audit information

The ATH must provide the MEP responsible for the metering installation with the record, certificate, or report for the metering installation within five business days of certification. The ATH must ensure the MEP receives the record. This can be either as an electronic copy or any other agreed format.

Audit observation

I checked the communication trail for 22 metering records.

Audit commentary

All records were provided within five business days. In nearly all cases, Trustpower is also the MEP.

Audit outcome

Compliant

3.10 Certification at a Lower Category (Clause 6(4) Of Schedule 10.7)

Code related audit information

If the ATH makes a determination to certify a metering installation at a lower category under clause 6 of Schedule 10.7, the certification report must include all information required to demonstrate compliance.

Audit observation

Trustpower has not certified any installations as a lower category.

Audit commentary

Trustpower has not certified any installations as a lower category.

Audit outcome

Not applicable

3.11 Meter Requirements (Clause 26(3) & (4) of Schedule 10.7)

Code related audit information

The ATH needs to document the following in the metering records:

- the meter manufacturer's required recommendations for regular maintenance
- any maintenance that has been carried out on the meter, such as battery monitoring and replacement.

An ATH must record in the metering installation certification report, the maximum interrogation cycle for the metering installation before it certifies a metering installation incorporating a meter.

Audit observation

I checked process documentation, conducted a walk-through of the process and checked 22 certification records.

Audit commentary

As a Class B ATH, Trustpower is unlikely to deal with any meters where maintenance is required. All AMI devices installed have battery monitoring conducted as part of the data collection function.

I checked 22 certification reports to confirm the maximum interrogation cycle is recorded. There were five AMI deployment certification reports where the maximum interrogation cycle was not recorded.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.11 With: Clause 26 (4) of Schedule 10.7 From: 01-Oct-17 To: 31-Jan-18	Metering installation certification report for AMI deployment does not contain the maximum interrogation cycle. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Field added to metering installation certification report		1/03/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

none		
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3.12 Meter Certification Expiry Date (Clause 27(5) of Schedule 10.7)

Code related audit information

The ATH must record the certification expiry date for each meter in a metering installation in the metering installation certification report and the meter certification report.

Audit observation

I checked 22 certification records to confirm compliance.

Audit commentary

Meter certification expiry dates are correctly calculated and recorded.

Audit outcome

Compliant

3.13 Measuring Transformer Requirements (Clause 28(3) of Schedule 10.7)

Code related audit information

The ATH needs to document the following in the metering records:

- *the manufacturer's recommendations for any regular maintenance required for the measuring transformer*
- *any maintenance that has been carried out on the measuring transformer.*

Audit observation

I checked whether any measuring transformers required maintenance.

Audit commentary

Trustpower has not installed any measuring transformers where maintenance is required.

Audit outcome

Not applicable

3.14 Determine Maximum Interrogation Cycle (Clause 36(3) & (4) Of Schedule 10.7)

Code related audit information

An ATH must record the maximum interrogation cycle for the metering installation. The maximum interrogation cycle for a metering installation is the shortest of the following periods:

- *the period of inherent data loss protection for the metering installation*
- *the period of memory availability given the data storage device configuration*
- *the period in which the accumulated drift of a data storage device clock is expected to exceed the maximum time error set out in Table 1 of clause 2 of Schedule 15.2 for the category of the metering installation.*

Audit observation

I checked 22 certification reports to confirm the maximum interrogation cycle is recorded.

Audit commentary

I checked 22 certification reports to confirm the maximum interrogation cycle is recorded. There were five AMI deployment certification reports where the maximum interrogation cycle was not recorded.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.14 With: Clause 28 (3) of Schedule 10.7 From: 01-Oct-17 To: 31-Jan-18	Metering installation certification report for AMI deployment does not contain the maximum interrogation cycle. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Field added to metering installation certification report		1/03/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
completed			

4. CALIBRATION AND CERTIFICATION OF METERING COMPONENTS

4.1 Accommodation and Environment (Clause 1(D)-(E) Of Schedule 10.4)

Code related audit information

The ATH must ensure that the environment in which its activities are undertaken is monitored, appropriate for the tests being carried out and unlikely to affect the required accuracy.

Audit observation

Trustpower does not operate a laboratory function because their scope is limited to field installation work. Temperature is measured and recorded when comparative certification is conducted.

Audit commentary

Trustpower does not operate a laboratory function because their scope is limited to field installation work. Temperature is measured and recorded when comparative certification is conducted.

Audit outcome

Compliant

4.2 Use of Measurement Standards (Clause 1(F) Of Schedule 10.4)

Code related audit information

The ATH must comply with the specific requirements of the applicable standard listed in Table 5 of Schedule 10.1.

Audit observation

I checked the standards being used and some test points to confirm compliance.

Audit commentary

Trustpower uses the correct standards.

Audit outcome

Compliant

4.3 Test Equipment (Clause 2 of Schedule 10.4)

Code related audit information

An ATH must, at all times, ensure that it has access to all items of equipment required for the performance of the calibrations and tests it is approved to undertake under this Part; and each item of equipment it uses is maintained in accordance with the manufacturer's recommendations and this Code. A class B ATH must have and maintain procedures for the purchase of test equipment and associated consumables.

Audit observation

TrustPower maintains a register of equipment, including test equipment. I confirmed this was up to date and that all relevant equipment is regularly checked and tested.

Audit commentary

Trustpower maintains a register of equipment, including test equipment. I confirmed this was up to date and that all relevant equipment is regularly checked and tested.

There have been no repairs during the audit period.

A class B ATH must have and maintain procedures for the purchase of test equipment and associated consumables. The relevant process was demonstrated during the audit. The relevant consumables are seals, sealing tools and stickers.

Audit outcome

Compliant

4.4 Calibration of Reference & Working Standards (Clause 3(1)(a), (b)(i) and (6) of Schedule 10.4)

Code related audit information

An ATH must ensure that any reference standard is calibrated by an approved calibration laboratory and that any working standard is calibrated by an approved calibration laboratory or class A ATH. The calibration reports for the calibrated standards must be held by the ATH and indicate that the standard is within the manufacturer's accuracy specifications.

Audit observation

Trustpower has 12 Hioki working standards and I checked the most recent calibration records.

Audit commentary

Trustpower has 12 Hioki working standards and they all have current calibration reports.

Audit outcome

Compliant

4.5 Calibration Interval (Clause 3(2) of Schedule 10.4)

Code related audit information

Each reference standard or working standard must be calibrated within the applicable calibration interval set out in Table 1 of Schedule 10.4.

Audit observation

I checked Trustpower's working standards to confirm they had current calibration certificates.

Audit commentary

Trustpower uses the applicable calibration intervals.

Audit outcome

Compliant

4.6 Calibration of Reference Standards (Clause 3(1)(B)(li), (2), (3)(C), (4) And (5) Of Schedule 10.4)

Code related audit information

Class A ATHs must ensure that in calibration of reference standards, any uncertainties are sufficiently small so that the overall uncertainty in the measurements used to test a metering installation does not exceed one third of the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of metering installation that the reference standard will be used to calibrate.

If a reference standard is used in conditions that deviate from those in the calibration report, the class A ATH must calculate and apply adjustments using its own processes and procedures so that the reference standard achieves the reference conditions.

If a reference standard is used in conditions that deviate from those in the calibration report, the class A ATH must calculate and apply adjustments using its own processes and procedures so that the reference standard achieves the reference conditions.

Audit observation

Trustpower does not have a reference standard.

Audit commentary

Trustpower does not have a reference standard.

Audit outcome

Not applicable

4.7 33kv Or Above Calibrated By An Approved Calibration Laboratory (Clause 3(3)(B) Of Schedule 10.4)

Code related audit information

Class A ATHs must ensure that a working standard on a system operating at a voltage of 33kV or above has been calibrated by an approved calibration laboratory.

Audit observation

Trustpower does not use HV working standards.

Audit commentary

Trustpower does not use HV working standards.

Audit outcome

Not applicable

4.8 Metering Component Testing System (Clause 4 of Schedule 10.4)

Code related audit information

An ATH may use a complete calibrated metering component testing system (a test bench) as an alternative to a separately calibrated working standard only if the ATH:

- calibrates the test bench as if it was a working standard*
- carries out a testing system accuracy test, using approved reference standards before completing the calibration report.*

Audit observation

Trustpower does not have a laboratory.

Audit commentary

Trustpower does not have a laboratory.

Audit outcome

Not applicable

4.9 Calibration Errors (Clause 5 of Schedule 10.4)

Code related audit information

A Standard cannot be used if the ATH believes it has a calibration error. If an error is found, then all ATH's that have used the standard must be notified. All metering installations certified using the standard must be treated as defective in accordance with Clause 10.43.

Audit observation

I checked Trustpower understands this requirement through interview. I checked whether this situation had occurred.

Audit commentary

Trustpower understands the requirements of this clause. There are no examples of standards with calibration errors.

Audit outcome

Compliant

4.10 Measurement Traceability (Clause 6 of Schedule 10.4)

Code related audit information

An ATH must document, maintain, and comply with a system that ensures, whenever it undertakes a calibration test or measurement, the ATH can replicate the test or measurement in every respect and the results of the measurements are traceable.

Audit observation

Trustpower conducts comparative certification and the records contain sufficient information for the test to be replicated.

Audit commentary

Trustpower conducts comparative certification and the records contain sufficient information for the test to be replicated.

Audit outcome

Compliant

4.11 Calibration Methods (Clause 7(6) of Schedule 10.4)

Code related audit information

An ATH must only use components that have been certified by an ATH or calibration laboratory.

A Class B ATH must follow 17025 calibration methods for components.

The test points must be those listed in the relevant IEC standard.

An ATH must ensure that uncertainty of measurement does not exceed one third of the error listed in the relevant IEC standard listed in Table 5.

If a CT is to be used in a Metering Installation is certified using the selected component method, then it must be tested for errors at 5% to 120% of rated current.

An ATH must have documented instructions for calibration that match the IEC standard.

Audit observation

I checked Trustpower whether calibrates components in accordance with this clause.

Audit commentary

Trustpower does not calibrate components.

Audit outcome

Not applicable

4.12 Data Storage Device Certification (Clause 5 of Schedule 10.8)

Code related audit information

All data storage devices must be certified before they can be used in a metering installation. The ATH must ensure that the data storage devices in a metering installation have been type tested by an approved test laboratory, that the results for data storage devices are appropriate for that model and version and have a calibration report.

Audit observation

I checked the certification records for 22 metering installations to confirm compliance.

Audit commentary

Trustpower certifies data storage devices in accordance with these clauses.

The data storage device certification and expiry dates are contained in Maximo but are not always recorded on the certification reports. I recommend these dates are included on all certification reports. The Trustpower ATH certifies non-AMI data storage devices but AMI devices are purchased pre-certified from Landis + Gyr. The certifying ATH is not clear on certification reports or in Maximo. I recommend clarity is improved for this information.

Trustpower provided type test reports and calibration reports for relevant devices. I recommend two improvements to the management of these reports, as follows:

1. ensure all type test reports and calibration reports are in a folder and are easily locatable
2. develop a table, including dates, to record the existence of type test reports and that they have been checked and approved.

Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Clause 5 of Schedule 10.8	Ensure data storage device certification date, expiry date and certifying ATH is clear in certification reports. Ensure all type test reports and calibration reports are in a folder and are easily locatable. Develop a table, including dates, to record the existence of type test reports and that they have been checked and approved.	Trustpower accepts these recommendations and will look to implement.	Identified

4.13 Metering Component Stickers (Clause 8(1) of Schedule 10.8)

Code related audit information

An ATH must confirm certification by attaching a metering component certification sticker to the metering component or, if not practicable, provide the sticker with the metering component.

Audit observation

I checked Trustpower's component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause. I checked photos of ten installations to confirm they were correctly applied.

Audit outcome

Compliant

4.14 Metering Component Stickers (Clause 8(2) of Schedule 10.8)

Code related audit information

A metering component certification sticker must show:

- the name of the metering component owner (if available)
- if the metering component is a meter or a measuring transformer:
 - a) the name of the ATH or the approved calibration laboratory who calibrated the metering component
 - b) the name of the ATH who certified the metering component
 - c) the date on which the metering component was certified
 - d) the initials or other unique identifier of the person who carried out the certification of the metering component.

Audit observation

I checked Trustpower's component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause. I checked photos of ten installations to confirm the stickers were correctly applied.

Audit outcome

Compliant

4.15 Sealing and Monitoring of Seals (Clause 9 of Schedule 10.4 & Clause 47(7) of Schedule 10.7)

Code related audit information

An ATH is required to have a documented system for applying seals to a metering installation to ensure that each metering component in the metering installation that could be expected to affect the accuracy or reliability of the metering installation is sealed. The system of sealing will ensure monitoring of the integrity of the metering installation and that unauthorised access to the metering installation will be identifiable so that the MEP can be notified.

The sealing system will identify:

- the ATH who affixed the seal
- the person (or the sealing tool) who applied the seal
- when the seal was applied.

Audit observation

I checked the quality documentation and a sample of 22 certification records to confirm compliance.

Audit commentary

Trustpower uses the wire and ferrule method for sealing. Nylon "wire" is used where stainless wire would not be appropriate, e.g. for the sealing of potential fuses. I confirmed the accuracy of the sealing tool register during the audit.

Audit outcome

Compliant

5. CALIBRATION AND CERTIFICATION OF METERING INSTALLATIONS

5.1 ATH Must Not Certify Metering Installations under Certain Circumstances (Clause 8(1) Of Schedule 10.7)

Code related audit information

The ATH must not certify a metering installation if the installation does not comply with Part 10.

Audit observation

I checked a sample of 22 certification records and I checked the statistical sampling results to confirm compliance.

Audit commentary

All 22 metering installations complied with Part 10. 22 of the statistically sampled population had three phase meters with only one phase metered, but they were still recertified, despite not complying with Part 10.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.1 With: Clause 8(1) Of Schedule 10.7 From: 01-Nov-17 To: 23-Jan-18	22 metering installations certified with single phase meters on three phase installations. Potential impact: Medium Actual impact: Unknown Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	Rationale for audit risk rating

Low	The controls are recorded as moderate because most certification activities achieve compliance.		
	The impact on settlement and participants is unknown but there are only a small number of installations; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Trustpower acknowledges that these were incorrectly certified using statistical sampling and failed to identify that these meters were indeed on three phase installations.		12/02/2018	Identified
Trustpower has since updated the certification expiry date for these sites and ensured that they are on our program of work for recertification.			
Preventative actions taken to ensure no further issues will occur		Completion date	
Added a step in sample selection process to exclude in future		12/02/2018	

5.2 Determination of Metering Categories (Clause 5 of Schedule 10.7 & Clause 10.11)

Code related audit information

An ATH is required to determine the category of the metering installation in accordance with Table 1 of Schedule 10.1 before it certifies a metering installation.

Audit observation

I checked certification records for 22 metering installations to confirm compliance.

Audit commentary

All 22 certification reports had the metering category recorded correctly.

Audit outcome

Compliant

5.3 Requirement for Metering Installation Design Report (Clause 2(4) Of Schedule 10.7)

Code related audit information

The ATH must receive a design report from the MEP before installing or modifying a metering installation or a component in a metering installation.

Audit observation

I checked the current suite of design reports and the certification records for 22 metering installations.

Audit commentary

Trustpower is both the MEP and the ATH. I checked the design reports and confirm they are all compliant.

Audit outcome

Compliant

5.4 ATH Design Report Obligations (Clause 3 of Schedule 10.7)

Code related audit information

Before certifying a metering installation, the ATH must check the design report to confirm the metering installation will function as designed and that the metering installation will comply with Part 10.

The certifying ATH must update the design report with any changes and provide it to the MEP responsible for the installation within 10 days of installation certification.

Audit observation

I checked the current suite of design reports and the certification records for 10 metering installations.

Audit commentary

The design reports contain all of the required information, including configuration schemes and schematic drawings. There were no examples of changes to design reports.

Audit outcome

Compliant

5.5 Certification as a Lower Category (Clause 6(1) of Schedule 10.7)

Code related audit information

An ATH may determine that the metering category of a current transformer installation is lower than would otherwise be the case and certify the installation at that lower category only if:

- a protection device, like a fuse or a circuit breaker, is installed so that it limits the maximum current; or*
- the MEP provides evidence from historical data that the maximum current will be lower than the current setting of the protection device for the category that metering installation is currently certified at; or*
- the components in the metering installation will use less than 0.5 GWh in any 12-month period; or*
- the MEP provides evidence from historical data that the installation will use less than 0.5 GWh in any 12-month period.*

Audit observation

Trustpower has not certified any installations as a lower category.

Audit commentary

Trustpower has not certified any installations as a lower category.

Audit outcome

Not applicable

5.6 Use of Current Transformer Rating Lower Than Supply Capacity (Clause 6(2)(a) of Schedule 10.7)

Code related audit information

If the ATH determines the category of a current transformer metering installation is lower than would otherwise be the case and a current limiting device is used, the ATH must:

- *confirm the suitability and operational condition of the protection device*
- *record the rating and setting of the protection device in the metering records*
- *seal the protection device*
- *apply, if practicable, a warning tag or label to the seal.*

Audit observation

Trustpower has not certified any installations as a lower category.

Audit commentary

Trustpower has not certified any installations as a lower category.

Audit outcome

Not applicable

5.7 Determining Metering Installation Category at a Lower Category Using Current Transformer Rating (Clause 6(2)(b) & (d) of Schedule 10.7)

Code related audit information

The ATH may determine the metering installation category according to the metering installation's expected maximum current, if:

- *there has been a request to do so from the MEP;*
- *the MEP provides evidence from historical data that the maximum current will be lower than the current setting of the protection device for the category that metering installation is currently certified; and*
- *the ATH considers it is appropriate to do so in the circumstances.*

The MEP must obtain the maximum current that flows through the installation each month from the participant interrogating the installation. From this data the ATH can calculate the maximum current from the raw meter data by either calculation from the kVA by trading period if available or from a maximum current indicator if fitted. If the MEP does not receive the monthly report from the participant interrogating the installation or if the current exceeds the maximum calculated rating of the installation, the certification of the installation is automatically cancelled.

Audit observation

Trustpower has not certified any installations as a lower category.

Audit commentary

Trustpower has not certified any installations as a lower category.

Audit outcome

Not applicable

5.8 Suitability Of Determination Of a Metering Installation Category at a Lower Category Using Current Transformer Rating (Clause 6(3) Of Schedule 10.7)

Code related audit information

Before the ATH determines a metering installation to be a lower category, the ATH must first visit the site of the metering installation to ensure it is suitable for the metering installation to be determined to be a lower category.

Audit observation

Trustpower has not certified any installations as a lower category.

Audit commentary

Trustpower has not certified any installations as a lower category.

Audit outcome

Not applicable

5.9 Use of Metering Installation Certification Methods (Clause 7(1) Of Schedule 10.7)

Code related audit information

When certifying a metering installation, the ATH must use either of the following methods:

- a) the selected component certification method if the metering installation is category 1, 2, or 3; or
- b) the fully calibrated certification method.

Audit observation

I checked certification records for 22 metering installations and statistical sampling results to confirm compliance.

Audit commentary

Trustpower uses the comparative method of certification for new connections as well as for recertification. This clause and Clause 12 of Schedule 10.7 makes it clear that comparative certification can only be used to recertify metering installations; therefore it cannot be used for the initial certification. There is no risk of installation inaccuracy; in fact the comparative test methodology is very robust, but installations certified under this clause will theoretically require a repeat of the comparative test if just the meter is changed, where if selected component certification was applied then a meter could be changed within the 10 year certification period. An additional point is that the certification reports often have a CT expiry date earlier than the installation expiry date. For example, ICP 0006001554TUE33 was certified on 10/10/2017, with an expiry of 10/10/2027, but the CTs are showing as expiring on 25/05/2027. Screenshots are shown below. This matter is raised in **Section 5.19**.

Sealing Tool Number: 191	Certified in accordance with clause: 12 of COP 10.7 (comparative)
Certification Date: 10/10/2017	Certification Expiry Date: 10/10/2027

Category 2 certification period: 10 years (≤500A)

Current Transformers			
Serial Numbers (Red/Yellow/Blue)	S1701/27-1	S1701/27-2	S1701/27-3
Make/Type/Ratio	TWS	SEV86A	300/5
Accuracy Class/Burden	0.5	5	VA
Certification Date	25/05/2017	Expiry Date	25/05/2027
Certified By	TWS	CT Owner	TRUS

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 5.9 With: Clause 7(1) of Schedule 10.7 From: 01-Dec-16 To: 31-Jan-18	Comparative method used for certification and should only be used for recertification. Potential impact: None Actual impact: None Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because there is room for improvement. The only impact is potential confusion if another participant is involved in the next certification; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Trustpower acknowledges using the comparative method for certifying new CT installations with calibrated metering components, and has performed this 'high' level method of certification since 1997. The test requirements for both Selected component certification and Comparative recertification methods are identical, as in Table 3 of Schedule 10.1. To resolve this issue, Trustpower will certify all future new CT installations by selected component method using the same process.		12/02/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Notify all CT authorised AMCs to select by component method for new CT metering sites.		1/03/2018	

5.10 Certification of a Metering Installation Using Statistical Sampling or Comparative Recertification (Clause 7(2) Of Schedule 10.7)

Code related audit information

In addition to the selected component and fully calibrated methods, the ATH may also recertify an installation using:

- a) an approved statistical sampling process for category 1 metering installations; or*
- b) the approved comparative recertification method for a category 2 metering installation*

Audit observation

I checked certification records for 15 category 2 metering installations and the statistical sampling results to confirm compliance.

Audit commentary

As mentioned in **Section 5.9**, Trustpower used the comparative method of certification for new metering installations, when it should only be used for recertification. Non-compliance is recorded in **Section 5.9**.

Trustpower conducted statistical sampling recertification for a population of meters and certified the metering installations based on the results. As recorded in **Section 5.1**, 22 installations were certified where single phase meters were installed on three phase installations. Non-compliance is recorded in **Section 5.1**.

Audit outcome

Compliant

5.11 Metering Installation Certification Requirements (Clause 8(3) Of Schedule 10.7)

Code related audit information

An ATH may only certify a metering installation as category 3 or higher if the metering installation incorporates a half hour meter.

Audit observation

Trustpower has not conducted certification of installations above Category 2.

Audit commentary

Trustpower has not conducted certification of installations above Category 2.

Audit outcome

Not applicable

5.12 Certification Tests (Clause 9(1) of Schedule 10.7)

Code related audit information

An ATH, when required to carry out tests specified in Tables 3 or 4 of Schedule 10.1, must comply with the provisions of clause 9(1) of Schedule 10.7 for the following tests:

- a prevailing load test*
- an installation or component configuration test*
- a raw meter data output test.*

A prevailing load test is defined in the Code as a test that is carried out by comparing the output of the metering installation against a working standard connected to the metering installation. For a category 2 or higher metering installation, the prevailing load check must be done against a calibrated instrument (working standard). For a category 1 metering installation industry, best practice has defined a prevailing load test as a measurement of disk revolutions or pulses compared with time and current measurements. The revolutions or pulses are compared against a table or chart to validate the accuracy of the measurement. The prevailing load check is more than simply confirming that the meter operates but is only intended to identify a "gross error" like a phase missing or reversed or a significant metering error.

If the ATH carries out an installation or component configuration test on a metering installation or a metering component, it must ensure that the test equipment configuration is the same as the metering installation or component configuration recorded in the design report.

A raw meter data output test is carried out for a category 1 metering installation or category 2 metering installation by comparing a known load change against the increment of the sum of the meter registers.

Audit observation

I checked process documentation and 22 certification reports to confirm compliance.

Audit commentary

Prevailing load tests for comparative recertification are conducted using a working standard.

The design report reference is included in certification records and this serves the purpose of confirming the configuration scheme.

- Prevailing load tests must be conducted on a metering installation or metering component by using a working standard connected to the metering installation. Trustpower has conducted prevailing load tests in accordance with this clause using a working standard.
- Installation or component configuration tests must ensure that the actual configuration scheme is the same as the scheme for the metering installation or metering component recorded in the design report. The configuration scheme is recorded on the design report and in the AMI back office. There are not multiple configuration schemes and all devices are supplied to technicians pre-programmed, so there is little risk of incorrect schemes.
- Raw meter data output tests for a category 1 metering installations or category 2 metering installations, must be conducted by applying a measured increase in load and measuring the increment of the sum of the meter registers, or the accumulation of pulses resulting from the increase in load. This test is conducted by using the pulse counting method using an increase in load from zero to a known load. A memo was provided to the industry on 17/06/14, which stipulated that this test be conducted at two different measured load values. I have asked the Authority if “zero” is considered a load value and whether an increase from zero to a known load is acceptable. The Authority advised that this matter is the subject of a legal review, so I have not recorded the compliance status of the Trustpower process. Raw meter data output tests for AMI installations are conducted by comparing current recorded by the device against current recorded by the head end. The hand held device “reads” the instantaneous current through Bluetooth, this is sent to the back office and is compared against the back office recording of current.
- Raw meter data output tests for a HHR metering installation which are category 1 or category 2 must be conducted by either:
 - Comparing the output from a working standard to the raw meter data from the metering installation for a minimum of one trading period; or
 - Confirming that the metering equipment provider’s back office processes include a comparison of the difference in the increment of the meter registers to the half-hour metering raw meter data, if the raw meter data is to be used for the purposes of Part 15. Full HHR load tests are conducted for some installations. Landis + Gyr has a process to compare HHR values to the register values in the back office for AMI installations.

- Raw meter data output tests for category 3 or higher HHR metering installations must compare the output of a working standard to the raw meter data from the metering installation for a minimum of one trading period. Trustpower does not certify installations above category 2.
- Raw meter data output tests for NHH Category 2 metering installations must compare the output of a working standard to the increment of the sum of the meter registers. Trustpower has conducted raw meter data output tests in accordance with this clause using a working standard.

Audit outcome

Compliant

5.13 Raw Meter Data Test For All Metering Installations (Clause 9(1A) Of Schedule 10.7)

Code related audit information

If the ATH performs a raw meter data output test under sub-clause (1)(c) or sub-clause (1)(d), for a metering installation that will be certified for remote meter reading, the ATH must:

- a) obtain the raw meter data from the back office system where the raw meter data is held; or*
- b) ensure that the metering equipment provider responsible for the metering installation has a process to validate a meter reading taken at the time of the metering installation certification with a meter reading from the metering equipment provider's back office system.*

Audit observation

I checked practices and 22 certification reports to confirm compliance.

Audit commentary

Raw meter data output tests for AMI installations are conducted by comparing current recorded by the device against current recorded by the head end. The hand held device “reads” the instantaneous current through Bluetooth; this is sent to the back office and is compared against the back office recording of current. I believe this test achieves compliance with the requirements of this clause.

Audit outcome

Compliant

5.14 Alternate Raw Meter Data Test For Category 1 And 2 Metering Installations (Clause 9(1)(C) Of Schedule 10.7)

Code related audit information

A raw meter data output test is carried out for a category 1 metering installation or category 2 metering installation by comparing a known load change against the increment of the sum of the meter registers.

Audit observation

Refer to **Sections 5.12 and 5.13.**

Audit commentary

Refer to **Sections 5.12 and 5.13.**

Audit outcome

Compliant

5.15 Raw Meter Data Output Test (Clause 9(2) And 9(3) Of Schedule 10.7)

Code related audit information

If the ATH performs a raw meter data output test that requires a comparison between two quantities, the ATH must not certify the metering installation unless the test demonstrates that the difference between the two quantities is within the applicable accuracy tolerances set out in Table 1 of Schedule 10.1.

Audit observation

I checked process documentation and records for 22 metering installations to confirm compliance.

Audit commentary

There were no examples of inaccurate or failed test results.

Audit outcome

Compliant

5.16 Test Results (Clause 10(1) & (2) of Schedule 10.7)

Code related audit information

An ATH must not certify a metering installation if the results of tests on the metering installation or any of its metering components find that:

- a metering component did not pass all the tests*
- the metering installation did not meet the requirements for certification.*

Within five business days of reviewing the tests, the ATH must advise the relevant MEP why it did not certify the metering installation.

Audit observation

I checked process documentation and records for 22 metering installations to confirm compliance.

Audit commentary

There were no examples of metering components failing tests.

Audit outcome

Compliant

5.17 Selected Component Certification (Clause 11(2) of Schedule 10.7)

Code related audit information

An ATH may only use the selected component certification method to certify a metering installation which complies with the categories and component specifications set out in Table 1 of Schedule 10.1.

Audit observation

I checked process documentation and records for 22 metering installations to confirm compliance.

Audit commentary

The process documentation is clear, and all selected component certification reports were compliant.

Audit outcome

Compliant

5.18 Selected Component - Circumstances Where Method May Be Used (Clause 11(3) Of Schedule 10.7)

Code related audit information

An ATH must only use the selected component certification method to certify the metering installation if:

- the required tests in Table 3 of Schedule 10.1 are carried out*
- each data storage device, meter, and measuring transformer has been calibrated and certified*
- each data storage device is certified in accordance with clause 5 of Schedule 10.8*
- the ATH provides a certification report for the metering installation.*

Audit observation

I checked process documentation and records for 22 metering installations to confirm compliance.

Audit commentary

The process documentation is clear, and all selected component certification reports were compliant.

Audit outcome

Compliant

5.19 Comparative Recertification – Circumstances Where Method May be Used (Clause 12(2) of Schedule 10.7)

Code related audit information

An ATH may only use the comparative recertification method to recertify a category 2 metering installation if:

- the certification of the current transformers in the metering installation expire before the meter certification expiry date*
- each data storage device and/or meter has been calibrated and certified.*

Audit observation

I checked process documentation and records for 15 metering installations to confirm compliance.

Audit commentary

The process documentation is clear, and all comparative certification reports contained confirmation that the meter was replaced by another certified meter. As recorded in **Section 5.9**, comparative certification was applied to some installations where selected component certification should have been applied.

Audit outcome

Compliant

5.20 Comparative Recertification Tests (Clause 12(3) And 12(5)(A) Of Schedule 10.7)

Code related audit information

An ATH must, when recertifying the category 2 metering installation using the comparative recertification metering installation certification method, ensure that:

- the metering installation has passed the tests set out in Table 3 of Schedule 10.1 using a working standard*
- the accuracy of the current measurement sensor (current transformer or high accuracy Rogowski coil) enables the metering installation to meet the specified accuracy requirements of Table 1 of Schedule 10.1*
- the overall metering installation accuracy meets the requirements of Table 1 of Schedule 10.1 and*
- the ATH provides a certification report for the metering installation.*

Audit observation

I checked process documentation and records for 15 metering installations to confirm compliance.

Audit commentary

The certification reports confirmed that appropriate testing was conducted and that the total accuracy was within the requirements of table 1. A certification report was provided for each metering installation.

Audit outcome

Compliant

5.21 Fully Calibrated – Circumstances Where Method May be Used (Clause 13(3) of Schedule 10.7)

Code related audit information

An ATH must use the fully calibrated certification method to certify the metering installation:

- by carrying out the tests set out in Table 4 of Schedule 10.1*
- if each of the components (the data storage device, meter, and measuring transformer) has been calibrated and certified.*

Audit observation

Trustpower does not conduct certification under this clause.

Audit commentary

Trustpower does not conduct certification under this clause.

Audit outcome

Not applicable

5.22 Fully Calibrated - Certify Each Metering Component (Clause 13(4) Of Schedule 10.7)

Code related audit information

Each individual metering component in the metering installation must have a current certification report that confirms that the metering component complies with the requirements of its accuracy class; and includes the certification date of the metering component.

Audit observation

Trustpower does not conduct certification under this clause.

Audit commentary

Trustpower does not conduct certification under this clause.

Audit outcome

Not applicable

5.23 Fully Calibrated - Additional Metering Installation Certification Report Requirements (Clause 13(5) & (6) Of Schedule 10.7)

Code related audit information

The ATH must provide a certification report for the metering installation. The certification report must include confirmation that:

- the ATH has checked the design report of the metering installation to confirm the metering installation functions in accordance with the report*
- the overall metering installation accuracy meets the requirements of Table 1 of Schedule 10.1*
- the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation*
- each metering component in the metering installation is used only in a permitted combination as set out in table 1 of Schedule 10.1.*

Audit observation

Trustpower does not conduct certification under this clause.

Audit commentary

Trustpower does not conduct certification under this clause.

Audit outcome

Not applicable

5.24 Fully Calibrated – Use Meter Class Accuracy (Clause 13(7) Of Schedule 10.7)

Code related audit information

An ATH must, before it certifies a metering installation, ensure that the ATH uses the meter class accuracy, and not the actual accuracy, to calculate whether the actual error is within the maximum permitted error.

Audit observation

Trustpower does not conduct certification under this clause.

Audit commentary

Trustpower does not conduct certification under this clause.

Audit outcome

Not applicable

5.25 Insufficient Load (Clause 14 of Schedule 10.7)

Code related audit information

Every metering installation requires a test to ensure that the installation is correctly recording the energy used at the installation. The tests required are defined in Tables 3 and 4 of Schedule 10.1. The checks range from a minimum check that the meter registers increment through to a full raw meter data output check against a working standard and a check against the back office data for a half hour installation.

If the ATH decides to certify half hour metering installation that has insufficient load to complete a prevailing load check, the ATH must ensure that:

- it performs an additional integrity check of the metering installation wiring, and records the results of this check in the certification report*
- it records in the certification report that the metering installation is certified under clause 14 of Schedule 10.7.*

Once load is present and following a request from the MEP, the ATH must carry out prevailing load tests. If the tests demonstrate that the metering installation performs within the maximum permitted error, the certifying ATH must:

- update the metering installation certification report, within five business days of completing the tests, to include the results of the tests carried out*
- leave the original metering installation certification expiry date unchanged.*

Audit observation

Trustpower has not conducted insufficient load certification.

Audit commentary

Trustpower has not conducted insufficient load certification.

Audit outcome

Not applicable

5.26 Statistical Sampling (Clause 16 of Schedule 10.7)

Code related audit information

A group of meters can be sampled by the ATH and the results of the sample group can be extended to a larger group of the same meters. This is a process of certification by statistical sampling. The ATH must select a sample using a statistical sampling process that is:

- detailed in AS/NZS1284 (or approved and published by the Authority)*
- recertify the group by recertifying each metering installation in the sample using the fully calibrated certification method*
- advise the MEP as soon as reasonably practicable whether the sample passes or fails the recertification requirements.*

If the ATH carries out a statistical sampling process when recertifying a group of category 1 metering installations on behalf of an MEP, it must document and record:

- the process it follows for selecting samples*
- any assumptions about those samples*
- the metering installations in the sample*
- the metering installations in the recertified group.*

An ATH that recertifies a group of metering installations using a statistical sampling process does not need to apply a certification sticker to the remainder of the metering installations in the family or group that was sample tested.

Audit observation

Trustpower has conducted statistical sampling recertification. The process and records are compliant with regard to the metering components; however, as recorded in **Section 5.1**, 22 three phase installations were certified when they only had a single phase meter installed.

Audit commentary

Trustpower has conducted statistical sampling recertification. The process and records are compliant with regard to the metering components; however, as recorded in **Section 5.1**, 22 three phase installations were certified when they only had a single phase meter installed. Compliance is confirmed for Clause 16 of Schedule 10.7.

Audit outcome

Compliant

5.27 Statistical Sampling - Certification Method (Clause 7(3) Of Schedule 10.7)

Code related audit information

If the ATH uses statistical sampling, it must use either the selected component method or the fully calibrated method, as applicable, to certify each metering installation in the sample.

Audit observation

Selected component certification was used for each of the sample installations.

Audit commentary

Selected component certification was used for each of the sample installations.

Audit outcome

Compliant

5.28 Certification Validity Periods (Clause 17 of Schedule 10.7)

Code related audit information

A metering installation certification expiry date is the earliest of:

- a) the date of commissioning plus the maximum certification validity period for the relevant category of metering installation, as set out in Table 1 of Schedule 10.1; or*
- b) the earliest metering component certification expiry date; or*
- c) a date determined by the ATH if the ATH believes that the circumstances and condition of the components in a metering installation warrant deviation from Table 1 of Schedule 10.1.*

The expiry date for a metering installation in a group recertified using a statistical sampling process, is the earliest expiry date of the metering installations in the sample

Audit observation

I checked 22 metering installation certification records to confirm compliance.

Audit commentary

The commissioning date and expiry date is recorded correctly in the metering installation certification reports.

Audit outcome

Compliant

5.29 Metering Installation Accuracy (Clause 21 of Schedule 10.7)

Code related audit information

An ATH must, before it certifies a metering installation, ensure that the metering installation does not exceed the relevant maximum permitted error after the application of any external compensation factors.

Audit observation

I checked 15 metering installation certification records to confirm compliance.

Audit commentary

The process documentation stipulates the maximum permitted errors for certification. I checked a sample of certification records that confirmed this was being applied correctly.

Audit outcome

Compliant

5.30 Error Calculation (Clause 22 of Schedule 10.7)

Code related audit information

If a metering installation is certified using the comparative recertification or fully calibrated methods, the ATH must calculate and record the percentage of overall error of the metering installation. The ATH must calculate this using appropriate mathematical methods that include:

- all sources of measurement error including test instrument errors, reference standard variations when used in conditions that deviate from those in the calibration report, variations in repeated observations, the instrument resolution or discrimination threshold and any assumptions incorporated in the measurement method and procedure*
- the error calculation must include the uncertainty in the measurement at a 95% level of confidence using JCGM 100:2008*
- the error and its calculation must be recorded in the certification report.*

The ATH must not certify the metering installation if the uncertainty is greater than the maximum permitted site uncertainty or the combined error that includes the measured error and the uncertainty, is greater than the maximum permitted installation error.

Audit observation

I checked 15 metering installation certification records and discussed the process for error calculation.

Audit commentary

Trustpower's methodology includes the uncertainty associated with the working standards and clamps, plus consideration of temperature. The calculation methodology is compliant. A screenshot below shows the recording of error and uncertainty.

Installation Accuracy Test					
Meter Installed	Start	End	Total	Reference instrument detail	Hioki TPW01 ▾
Number of meter pulses	0	84	84	Reference instrument CT type	Rigid Clip-on CTs ▾
kWh represented by pulses (Emeter)	1.01	kWh		Reference instrument uncertainty	0.48 %
Reference instrument (Eref)	1.01	kWh		Installation uncertainty	0.18 %
Difference (EC= Emeter - Eref)	0.00	kWh		Total uncertainty (μ)	0.660 %
Installation error EC/Eref (x100%)	0.10	%		Temperature during test	9 °C
Total installation error (including μ)	0,94	%	(Maximum error ≤2.5% Category 2)		
	-0,74	%			

Audit outcome

Compliant

5.31 Compensation Factors (Clause 24(1)(b) of Schedule 10.7)

Code related audit information

Before it certifies a metering installation that requires a compensation factor to adjust raw meter data, the ATH must:

- advise the MEP of the compensation factor
- ensure that the compensation factor that will be applied to raw meter data external to the metering installation is applied as follows:
 - a) for ratio compensation, on a category 1 metering installation or higher category of metering installation; or
 - b) for error compensation, on a metering installation that quantifies electricity conveyed through a point of connection to the grid; or
 - c) for loss compensation, only on a category 3 or higher metering installation.

Audit observation

I checked 15 metering installation certification records, and process documentation.

Audit commentary

Trustpower has a documented process for the management of compensation factors (multipliers). The testing procedures provide confirmation of the multiplier and CT ratio, the multiplier is recorded on the metering installation certification report. Trustpower only deals with multipliers, not loss or error compensation factors.

Audit outcome

Compliant

5.32 Record Metering Installation Compensation Factor (Clause 24(2) Of Schedule 10.7)

Code related audit information

If a compensation factor is applied to a metering installation, the ATH must record in the certification report, the methodology, assumptions, measurements, calculation and details of each compensation factor that is included within the internal configuration of the metering installation and each compensation factor that must be applied to the raw meter data.

Audit observation

I checked 15 metering installation certification records, and process documentation.

Audit commentary

Trustpower has a documented process for the management of compensation factors (multipliers). The testing procedures provide confirmation of the multiplier and CT ratio, the multiplier is recorded on the metering installation certification report. Trustpower only deals with multipliers, not loss or error compensation factors.

Audit outcome

Compliant

5.33 Installation of Metering Components (Clause 25 of Schedule 10.7)

Code related audit information

Before it certifies a metering installation, the ATH must ensure that the installation of the metering components was carried out by an ATH. However, a suitably qualified person such as a switchboard manufacturer may install the measuring transformers and any required associated burden, the test facilities, potential fuses and switchboard wiring.

Before it certifies a metering installation, the ATH must ensure that each metering component is installed in accordance with the installation design report.

Audit observation

I checked process documentation and conducted a walk-through of the process.

Audit commentary

This clause is designed to allow switchboard manufacturers to install measuring transformers in switchboards at the time of manufacture. This clause does not allow the installation of meters or data loggers. Trustpower has a documented process to ensure compliance with this clause. Only CTs and test blocks are supplied, not meters.

Audit outcome

Compliant

5.34 Determine Metering Installation Certification Expiry Date (Clause 27(1) & (2) Of Schedule 10.7)

Code related audit information

The ATH needs to determine the meter certification expiry date for each meter in a metering installation. The meter certification expiry date must be the earliest end date of the following periods, calculated from the date of commissioning of the metering installation:

- a) the maximum metering installation certification validity period for the relevant category of metering installation; or*
- b) the maximum meter certification validity period set out in Table 2 of Schedule 10.1 for the relevant class of meter for the metering installation; or*
- c) the certification period specified in the meter certification report.*

Audit observation

I checked 22 certification records to confirm compliance.

Audit commentary

As recorded in **Section 5.9**, Category 2 metering installations have been certified using the comparative method and the installation expiry date has been calculated from the commissioning date, however the CT expiry date is calculated from the CT certification date not the commissioning date. This means the installation expiry date is later than the CT expiry date. The selected component method should be used with all expiry dates calculated from the commissioning date.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 5.34 With: Clause 27(1) & (2) Of Schedule 10.7 From: 01-Jan-17 To: 31-Jan-18	Installation expiry date later than CT expiry date. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because there is room for improvement. The impact is very minor; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
New CT installations will be certified using the component method whereby all expiry dates are calculated from the commissioning date		1/03/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Staff training and process update		1/03/2018	

5.35 Electromechanical Meter Certification Shelf Life (Clause 27(4) Of Schedule 10.7)

Code related audit information

If an electromechanical meter is not installed in a metering installation within 24 months of the date of the meter's certification report, the meter must be recertified before it is installed.

Audit observation

I checked 22 certification records to confirm compliance.

Audit commentary

None of the installations had electromechanical meters. Trustpower understands the requirements of this clause. Electromechanical meters are seldom installed.

Audit outcome

Compliant

5.36 Measuring Transformers Must Be Certified (Clause 28(2) Of Schedule 10.7)

Code related audit information

All measuring transformers must be certified before they can be used in a metering installation. If a measuring transformer has previously been used in another metering installation, the ATH must ensure that the measuring transformer has been recalibrated since it was removed from the previous metering installation. This must be undertaken either by an approved calibration laboratory or an ATH.

Audit observation

I checked 15 certification records to confirm compliance.

Audit commentary

All of the installations had certified measuring transformers. Trustpower has a clear understanding of this requirement.

Audit outcome

Compliant

5.37 Measuring Transformers Used In A Certified Metering Installation (Clause 28(4) Of Schedule 10.7)

Code related audit information

To certify any metering installation incorporating measuring transformers, the ATH must ensure that:

- the installation has certified measuring transformers*
- the installation has a test facility which has provision for isolation, installed as physically close to the meter as practical in the circumstances*
- the test facility is fitted with a transparent cover*
- the installation has securely mounted measuring transformers which are, if practicable, in a sealed enclosure*
- the ATH uses the measuring transformer's actual accuracy (rather than class accuracy) when calculating the maximum permitted error for the relevant metering installation category*
- any voltage supplies from a voltage transformer to a meter or that other equipment in the metering installation is protected by appropriately rated fuses or circuit breakers dedicated to the supply. All fuses and circuit breakers must be suitably sealed or located in sealed enclosures*
- the measuring transformer's secondary circuit is earthed and that it is earthed at no more than one point*
- the total burden (magnitude and phase angle, where appropriate), including burden resistors if used, on the measuring transformer does not exceed its name plate rating or an alternative rating lower than the name plate rating, if specified in the metering installation design report.*

Audit observation

I checked 15 certification records, including photos, and process documentation to confirm compliance.

Audit commentary

The process documentation and design reports stipulate all of the requirements above. The certification reports confirmed compliance with regard to certification and burden. Photos confirmed transparent covers were used.

Audit outcome

Compliant

5.38 Measuring Transformer Certification Expiry Date (Clause 29 of Schedule 10.7)

Code related audit information

The ATH needs to determine the measuring transformer certification expiry date for each measuring transformer in a metering installation. The measuring transformer certification expiry must be within the validity period specified in the measuring transformer certification report.

Audit observation

I checked 15 certification records to confirm compliance.

Audit commentary

CTs supplied by TWS have a certification date and a validity period. As recorded in **Section 5.9**, Trustpower has been applying a certification expiry date of 10 years from the certification date, not 10 years from the commissioning date. Whilst this is allowable under this clause, it causes an issue for the compliance of the installation expiry date, as recorded in **Section 5.34**.

Audit outcome

Compliant

5.39 Other Equipment Connected to Measuring Transformers (Clause 30 of Schedule 10.7)

Code related audit information

If the ATH certifies a metering installation incorporating a measuring transformer used by another metering installation, it must ensure that where voltage transformers are connected to more than one meter:

- *the meters are included in the metering installation being certified*
- *appropriate fuses or circuit breakers are provided to protect the metering circuit from short circuits or overloads affecting the other meter.*

While it is desirable that only metering equipment is connected to measuring transformers in a metering installation if, in some circumstances, the MEP connects other equipment to measuring transformers, the ATH must ensure that:

- *the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation category*
- *the metering installation certification report confirms that the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation*
- *any wiring between the equipment and any part of the metering installation is continuous*
- *the equipment is labelled appropriately, including with any de-energisation restrictions*
- *the connection details of the other equipment are recorded in the metering installation design report*
- *there are appropriate fuses or circuit breakers provided to protect the voltage transformer and metering circuit from short circuits or overloads affecting the other equipment.*

Audit observation

I checked whether the situation arises where other equipment is connected to measuring transformers.

Audit commentary

This scenario is not likely to occur with the scope of the Trustpower ATH operation, and no examples were available to review.

Audit outcome

Not applicable

5.40 Burden & Compensation (Clause 31 of Schedule 10.7)

Code related audit information

An ATH may certify a metering installation for a POC to the grid that includes error compensation factors as an alternative to the use of burden resistors only if the ATH is satisfied the error compensation factors will provide a more accurate result than the use of burden resistors.

An ATH may change the burden on a voltage transformer, without obtaining the approval of the MEP, if the ATH confirms in the certification report that the difference between the new burden and the burden at the time of the most recent metering installation certification is:

a) less than or equal to 1/30th of the VA rating of the voltage transformer, if the voltage transformer is rated at less than 30 VA; or

b) no greater than 1 VA, if the voltage transformer is rated at equal to or greater than 30 VA.

Before it certifies a measuring transformer where the in-service burden is less than the lowest burden test point specified in a standard set out in Table 5 of Schedule 10.1, the ATH must install burdening resistors to increase the in-service burden to be equal to or greater than the lowest test point of the measuring transformer certification test or confirm from the manufacturer of the instrument transformer that the accuracy will not be adversely affected by the low in service burden.

Audit observation

I checked processes and the records for 15 metering installations to confirm compliance.

Audit commentary

The issue of the low burden for CTs has been clarified by the Authority through a memo, which confirms that ATHs are required to take certain actions if the in-service burden is less than the lowest test point used when the CT was calibrated. The actions are to install burden resistors or confirm with a Class A ATH or the manufacturer that the CTs will continue to operate accurately at low burden. The industry has confirmed that TWS CTs record accurately at low burden but there is no information available for other makes of CT. Trustpower ran a query confirming that there were no installations certified in the last two years with non-TWS CTs. They intend to develop a process prior to the certification of any installations where low burden could be an issue.

Audit outcome

Compliant

5.41 Alternative Certification (Clause 32(1) of Schedule 10.7)

Code related audit information

If the ATH cannot comply with the requirements for certifying a measuring transformer solely due to the inability to obtain physical access to test the measuring transformers, it can certify the metering installation for a period not exceeding 24 months only if:

- the measuring transformer has not previously been certified due to failure to obtain access

- the ATH is satisfied that the metering installation will comply with the applicable accuracy requirements
- the ATH has advised the MEP that the metering installation has been certified by this method
- the MEP has advised the registry of the certification.

Audit observation

Trustpower has not applied alternative certification.

Audit commentary

Trustpower has not applied alternative certification.

Audit outcome

Not applicable

5.42 Installations Incorporating Control Devices (Clause 33(2) of Schedule 10.7)

Code related audit information

Before the ATH can certify a metering installation incorporating a control device that must be certified, it must ensure:

- that the certification expiry date for each control device is the same as the metering installation certification expiry date and record that date in the installation certification report
- that the control device complies with the applicable standards listed in Table 5 of Schedule 10.1
- the control device is fit for purpose
- if the metering installation contains a control device that has previously been used in another metering installation, that the control device is still fit for service.
- that the control device is:
 - a) likely to receive control signals
 - b) correctly connected
 - c) correctly programmed.

Audit observation

I checked certification records for 10 metering installations to confirm compliance.

Audit commentary

Trustpower is certifying control devices and correctly applying stickers. The control device certification expiry date is correctly recorded in the installation certification report. All points above are met.

Audit outcome

Compliant

5.43 Control Device Reliability (Clause 34(1) & (3) to (5) of Schedule 10.7)

Code related audit information

In order to ensure control device accuracy or the completeness of reconciliation information, the ATH must determine the likelihood of the control device not receiving control signals before it certifies a metering installation incorporating a control device.

If the ATH believes the likelihood of the control device not receiving control signals would affect the accuracy or completeness of the information for consumption reconciliation, the ATH may certify the remainder of the metering components and the installation, excluding the control device. The ATH

must advise the MEP within three business days of its decision. The MEP is then responsible for advising both the reconciliation participant for the POC for the metering installation and the control signal provider of the ATH's determination.

Audit observation

I checked correspondence in relation to this matter to determine compliance.

Audit commentary

As an MEP, Trustpower has good information of areas with signal propagation issues and appropriate instructions are provided to contractors.

Audit outcome

Compliant

5.44 Data Storage Devices (Clauses 36(2) of Schedule 10.7)

Code related audit information

If a data storage device has previously been used in another metering installation, the ATH must ensure that the data storage device has been recalibrated since it was removed from the previous metering installation by an approved calibration laboratory, an approved test laboratory, or an ATH.

Audit observation

I checked processes and the records for 22 metering installations to confirm compliance.

Audit commentary

All data storage devices are recertified prior to being reinstalled.

Audit outcome

Compliant

5.45 Data storage device requirements (Clause 38(1) and (2) of Schedule 10.7 and clause 5(1) of Schedule 10.8)

Code related audit information

An ATH must ensure that each data storage device in the metering installation:

- is installed so that on-site interrogation is possible without the need to interfere with seals*
- has a dedicated power supply unless the data storage device is integrated with another metering component*
- is compatible with each other metering component of the metering installation*
- is suitable for the electrical and environmental site conditions in which it is installed*
- has all of its outputs and inputs appropriately electrically isolated and rated for purpose*
- has no outputs that will interfere with the operation of the metering installation*
- records periods of data identifiable or deducible by both date and time on interrogation*
- has memory capacity and functionality that is suitable for the proposed functions of the data storage device specified in the design report for the metering installation*
- has availability of memory for a period that is suitable for the proposed functions as set out in the design report for the metering installation, and at least for a minimum continuous period of 15 days.*

The data storage device must have an event log which records the following:

- a) loss of power supply*

- b) critical internal alarms
- c) meter phase failure if integral to the meter
- d) software configuration changes
- e) a record of time changes.

Audit observation

I checked the availability of type test reports, and processes for determining environmental suitability.

Audit commentary

All of the points above apart from the point regarding environmental suitability are covered by the type test reports. Trustpower has appropriate instructions for the identification and recording of unsuitable environments.

Audit outcome

Compliant

5.46 Location of Metering Installation Certification Stickers (Clause 41(1) of Schedule 10.7)

Code related audit information

An ATH must confirm the metering installation certification by attaching a metering installation certification sticker as close as possible to the meter, while maintaining reasonable visibility of the certification sticker and the meter.

Audit observation

I checked the photos for 10 metering installations to confirm compliance.

Audit commentary

In all cases, the certification stickers contained the appropriate detail and were correctly applied.

Audit outcome

Compliant

5.47 Alternate Location of Metering Installation Certification Sticker (Clause 41(4) Of Schedule 10.7)

Code related audit information

If attaching a certification sticker is not practicable, the ATH must devise and use an alternative means of documenting the information and keep any metering component certification sticker with the documented information.

Audit observation

I checked with Trustpower whether this scenario had arisen.

Audit commentary

This scenario has not arisen and is unlikely to arise.

Audit outcome

Not applicable

5.48 Contents of Metering Installation Certification Sticker (Clause 41(2) Of Schedule 10.7)

Code related audit information

The metering installation certification sticker must show:

- the name of the ATH who certified the metering installation
- the certification date of the installation
- the metering installation category
- the ICP
- the certification number for the metering installation.

Audit observation

I checked the photos for 10 metering installations to confirm compliance.

Audit commentary

In all cases, the certification stickers contained the appropriate detail and were correctly applied.

Audit outcome

Compliant

5.49 Enclosures (Clause 42 of Schedule 10.7)

Code related audit information

An ATH must, before it certifies a metering installation, ensure that, if a metering component in the metering installation is housed in a separate enclosure from the meter enclosure, the enclosure is appropriate to the environment in which it is located and has a warning label attached stating that the enclosure houses a metering component.

Audit observation

I checked the photos for 10 metering installations to confirm compliance.

Audit commentary

Although this clause only refers to enclosures other than the metering enclosure, I have considered this clause to apply to metering enclosures as well.

The photos for 10 metering installations showed that all enclosures were appropriate for the environment, and the Trustpower certification sticker has an appropriate warning. Trustpower reviews photos of all installations to confirm enclosure suitability.

Audit outcome

Compliant

5.50 Metering Component Certification (Clause 43(1) of Schedule 10.7)

Code related audit information

Before certifying an installation, the ATH must ensure that each component has been certified by an ATH and has been stored appropriately since component certification.

Audit observation

I checked the processes for storage of components, and the records for 22 metering installations to confirm compliance.

Audit commentary

As mentioned in earlier sections, Trustpower has ensured each metering component is certified prior to certification of metering installations.

Trustpower has appropriate arrangements for storage and transportation.

Audit outcome

Compliant

5.51 Sealing Requirements (Clause 47(2) (3) (4) and (5) Of Schedule 10.7)

Code related audit information

Before an ATH certifies a metering installation or leaves it unattended, the ATH must ensure that each metering component that could reasonably be expected to affect the accuracy or reliability of the metering installation is sealed.

The metering components which must be sealed include:

- each part and connection of a data storage device in, or attached to, the metering installation except for a port for on-site reading that is not capable of carrying out any other function
- the main switch cover, if the main switch:
 - a) is on the supply side of the metering installation
 - b) has provision for sealing.

Audit observation

I checked process documentation, design reports and the photos for 10 metering installations to confirm compliance.

Audit commentary

The process documentation achieves compliance with all of the requirements above. Main switches are sealed where this is possible using paper seals. I confirmed the sealing tool number for a technician was correctly recorded in the sealing tool register, enabling tracking of the persons who apply any given seal. The date of application of seals is recorded in the metering installation certification record.

Audit outcome

Compliant

5.52 Seals for Metering Component Enclosures (Clause 47(6) Of Schedule 10.7)

Code related audit information

When applying a seal to a metering component in an enclosure, the ATH must attach a warning label in a prominent position inside the enclosure.

Audit observation

I checked process documentation, design reports and the photos for 10 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 10 metering installations confirm compliance. The warning label is installed in a prominent position.

Audit outcome

Compliant

5.53 Requirements for Sealing System (Clause 47(7) Of Schedule 10.7)

Code related audit information

An ATH must use a sealing system that enables identification of:

- *the ATH who affixed the seal*
- *the person (or the sealing tool) who applied the seal*
- *when the seal was applied.*

Audit observation

I checked process documentation, design reports and the photos for 10 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 10 metering installations confirm compliance. The certification records contain the relevant details required by this clause. The sealing tool register was confirmed as accurate and up to date.

Audit outcome

Compliant

5.54 Removal or Breakage of Seals (Clause 48(6) of Schedule 10.7)

Code related audit information

When the ATH investigates an unauthorised removal or breakage, it must assess the accuracy and continued integrity of the metering installation. If the ATH considers the accuracy and continued integrity is unaffected, it must replace the removed or broken seals.

If the accuracy and continued integrity is affected, the ATH must replace the removed or broken seal and advise the MEP that the metering installation is potentially inaccurate, defective, or not fit for purpose.

Audit observation

I checked the process documentation and reporting form for compliance.

Audit commentary

Trustpower has appropriate instructions in relation to this requirement, and there is the ability to record this information on the commissioning record for the installation, or on a Revenue Assurance form.

Audit outcome

Compliant

5.55 Wiring (Clause 6 of Schedule 10.8)

Code related audit information

An ATH must, before it certifies a metering installation, ensure that all wiring in the metering installation is suitable for the environment in which the metering installation is located, fit for purpose, securely fastened, and compliant with all applicable requirements and enactments.

The ATH must ensure that the wiring between metering components in the metering installation:

- is run as directly as practicable*
- is appropriately sized and protected*
- does not, to the extent practicable, include intermediate joints for any measuring transformer circuits*
- includes conductors that are clearly and permanently identified, by the use of any one or more of the following:*

a) colour coding

b) marker ferrules

c) conductor numbering.

If it is not practicable to exclude intermediate joints for any measuring transformer circuits, the ATH must ensure that the intermediate joints are sealed or in a sealed enclosure.

Audit observation

I checked process documentation, design reports and the photos for 10 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 10 metering installations confirm compliance.

Audit outcome

Compliant

5.56 Fuses and Circuit Breakers (Clause 7 of Schedule 10.8)

Code related audit information

An ATH must, before it certifies a metering installation, ensure that all fuses and circuit breakers that are part of the metering installation are appropriately rated for the electrical duty and discrimination required, clearly labelled and sealed or located in sealed enclosures.

Audit observation

I checked process documentation, design reports and the photos for 10 metering installations to confirm compliance.

Audit commentary

The checks demonstrated compliance with this requirement.

Audit outcome

Compliant

5.57 Calibration of Metering Components Where Relevant (Clause 7(1) Of Schedule 10.4)

Code related audit information

Before the ATH certifies a metering installation or metering component, it must ensure that the metering components have been calibrated by an approved calibration laboratory or an ATH with appropriate approval under Schedule 10.3.

Audit observation

I checked process documentation, design reports and 22 certification reports to confirm compliance.

Audit commentary

All certified components have calibration reports and stickers.

Audit outcome

Compliant

5.58 Requirement for Calibration of Metering Components (Clause 7(2) Of Schedule 10.4)

Code related audit information

Before the ATH certifies a metering component it must ensure that the component is calibrated or adjusted under the physical and electrical conditions specified in Table 5 of schedule 10.1 and the conditions permit the calculation of uncertainties at the reference conditions.

Audit observation

I checked process documentation, design reports and 10 certification reports to confirm compliance.

Audit commentary

All certified components have calibration reports and stickers.

Audit outcome

Compliant

5.59 Metering Component Calibration Method (Clause 7(3) Of Schedule 10.4)

Code related audit information

A class B ATH must follow the relevant requirements of ISO17025 for calibration of components and only use methodologies that have been verified in their most recent audit.

Audit observation

Trustpower's Class B ATH does not calibrate components.

Audit commentary

Trustpower's Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.60 Metering Component Calibration Test Points (Clause 7(4) Of Schedule 10.4)

Code related audit information

If the ATH calibrates a component it must ensure that the test points that it uses are either:

- no less than the test points in Table 5 of Schedule 10.1 or*
- sufficient to calculate the metering installation error as defined in clause 22 of Schedule 10.7.*

Audit observation

Trustpower's Class B ATH does not calibrate components.

Audit commentary

Trustpower's Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.61 Determine Metering Component Error and Record (Clause 7(5) Of Schedule 10.4)

Code related audit information

An ATH must, when calibrating a metering component:

- if necessary, adjust and document the error compensation*
- ensure that any adjustment carried out is appropriate to achieve an error as close as practicable to zero*
- ensure that the uncertainty of measurement during the calibration of the metering component does not exceed one third of the maximum permitted error in the relevant standard listed in Table 5 of Schedule 10.1.*

If the metering component is intended for a metering installation which will be certified using the selected component certification method, the ATH must ensure that the ATH records the errors of a current transformer from 5 % to 120 % of rated primary current.

Audit observation

Trustpower's Class B ATH does not calibrate components.

Audit commentary

Trustpower's Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.62 Class B ATH Calibrating Metering Components (Clause 2(3) Of Schedule 10.3)

Code related audit information

If a class B ATH wishes to calibrate components (such as class 0.5 meters, class 1 meters, class 2 meters, class 0.5 current transformers, and class 1.0 current transformers) this must be carried out under the relevant provisions and methodologies of ISO 17025. The final audit report must include a list of all relevant requirements of ISO 17025 for calibrating these metering components and all relevant methodologies audited.

Audit observation

Trustpower's Class B ATH does not calibrate components.

Audit commentary

Trustpower's Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.63 Meter Certification (Clause 1 of Schedule 10.8)

Code related audit information

All meters must be certified before they can be used in a metering installation. The ATH must ensure that the meters in a metering installation have been type tested by an approved test laboratory, that the results for the meter are appropriate for that meter model and version and have a calibration report.

Audit observation

I checked the certification records for 22 metering installations and Trustpower's database to confirm compliance.

Audit commentary

Trustpower certifies meters in accordance with this clause. As recorded in **Section 4.12**, I recommend Trustpower keeps a schedule of type test reports including confirmation they have been checked and approved. Type test reports were available for all current meter types.

Audit outcome

Compliant

5.64 Meter Requirements When Meter Is Relocated (Clause 26(2) Of Schedule 10.7 and Clause 43(2) Of Schedule 10.7)

Code related audit information

If a meter has previously been used in another metering installation, the ATH must ensure that the meter has been recalibrated since it was removed from the previous metering installation by an approved calibration laboratory or an ATH unless it is less than 12 months since the meter was commissioned in the previous installation.

Audit observation

I checked the process documentation in relation to this clause.

Audit commentary

This clause is designed to allow builder's temporary supplies to be portable without the need to calibrate the meter every time. Trustpower understands the requirements of this clause and has appropriate processes in place to correctly determine expiry dates.

Audit outcome

Compliant

5.65 Measuring Transformer Error Testing (Clause 2(1)(A) & (B) Of Schedule 10.8)

Code related audit information

Before certifying a measuring transformer, an ATH must test the measuring transformer's errors at a range of primary values at their rated burdens. If the measuring transformer is a multi-tap current transformer, an ATH must carry out the calibration tests and only certify the transformer for the ratios that have been calibrated.

Audit observation

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit commentary

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit outcome

Not applicable

5.66 Measuring Transformer Certification (Clause 3 of Schedule 10.8)

Code related audit information

Before it certifies a measuring transformer, the ATH must ensure that:

- *the measuring transformer has a current calibration report issued by an approved calibration laboratory or an ATH approved to carry out calibration*
- *the measuring transformer calibration report:*
 - *confirms that the measuring transformer complies with the standards listed in Table 5 of Schedule 10.1*
 - *records any tests the ATH has performed to confirm compliance*
 - *confirms that the measuring transformer has passed the tests*
 - *records any recommendations made by the ATH on error compensation*
 - *includes any manufacturer's calibration test reports.*

The ATH is required to produce a measuring transformer certification report that includes:

- *the date on which it certified the measuring transformer*
- *the certification validity period for the measuring transformer, which must be no more than 120 months*
- *whether the certification was based on batch test certificates*
- *if the certification was based on batch test certificates, confirmation that the manufacturer's batch testing facility is, in the ATH's opinion, of an acceptable standard*

The ATH must provide confirmation that the ATH has inspected the manufacturer's test certificates, and carried out any additional tests it considers necessary, to satisfy itself that the measuring transformer meets the accuracy requirements.

Audit observation

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit commentary

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit outcome

Not applicable

5.67 Measuring Transformers In Service Burden Lower Than Calibration Test Point Burden (Clause 2(1)(C) Of Schedule 10.8)

Code related audit information

If the in-service burden of a measuring transformer is lower than a test point specified in a standard listed in Table 5 of Schedule 10.1, the ATH must confirm the accuracy of the measuring transformer at the in-service burden by:

- a) obtaining confirmation of accuracies at the in-service burden from the measuring transformer's manufacturer; or*
- b) if the primary voltage of the measuring transformer is greater than 1 kV, a class A ATH calibrating the measuring transformer at the in-service burden.*

Audit observation

This matter is discussed in **Section 5.40**.

Audit commentary

This matter is discussed in **Section 5.40**, where I have confirmed Trustpower will develop an appropriate process if this scenario arises.

Audit outcome

Compliant

5.68 Measuring Transformer - Epoxy Insulated (Clause 2(2) Of Schedule 10.8)

Code related audit information

Before it certifies an epoxy insulated current transformer, the ATH must ensure that the certification tests allow for, and the metering installation certification report shows, the current transformer's age, temperature, and batch.

Audit observation

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit commentary

Trustpower has not conducted certification of measuring transformers. CTs for new installations, or where they are replaced as part of recertification, are supplied pre-certified by an ATH.

Audit outcome

Not applicable

5.69 Control Device Certification (Clause 4 of Schedule 10.8)

Code related audit information

Before it certifies a new control device, the ATH must produce a certification report that:

- *confirms that the control device complies with the applicable standards listed in Table 5 of Schedule 10.1*
- *includes the details and results of any test that the ATH has carried out to confirm compliance under paragraph (a)*
- *confirms that the control device has passed such tests.*

Before it certifies an existing installed control device, the ATH must produce a certification report that confirms:

- *that the control device is fit for purpose*
- *the control device certification validity period that the ATH considers appropriate, which must be no more than 180 months.*

Audit observation

I checked the certification records for 10 metering installations to confirm compliance.

Audit commentary

Trustpower certifies control devices in accordance with these clauses. The certification report is combined with the metering installation certification report and contains the required details.

Audit outcome

Compliant

5.70 Data Storage Devices (Clause 36(2) Of Schedule 10.7)

Code related audit information

If a data storage device has previously been used in another metering installation, the ATH must ensure that the data storage device has been recalibrated since it was removed from the previous metering installation by an approved calibration laboratory, an approved test laboratory, or an ATH.

Audit observation

I checked the certification records for 10 metering installations and the process documentation to confirm compliance.

Audit commentary

The process documentation and certification records confirmed that data storage devices are certified prior to installation.

Audit outcome

Compliant

5.71 On-site Calibration and Certification (Clause 9(1) of Schedule 10.8)

Code related audit information

An ATH may only calibrate a metering component on site in the metering component's normal environment by measuring the influence of all on-site variables and including their estimated effects in the uncertainty calculation. An ATH must ensure that:

- the effects of any departures from the reference conditions can accurately and reliably be calculated*
- the metering installation, in which the metering component is incorporated, is within the applicable accuracy tolerances set out in Table 1 of Schedule 10.1 after taking into account all known influences including temperature and temperature co-efficient measurements.*

Audit observation

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit commentary

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit outcome

Not applicable

5.72 On Site Metering Component Calibration (Clause 9(2) Of Schedule 10.8)

Code related audit information

If the ATH calibrates a metering component on site using manual methods, computers, or automated equipment for the capture, processing, manipulation, recording, reporting, storage, or retrieval of calibration data, it must ensure that its computer software:

- is documented in the ATH's procedures*
- can manipulate the variables that affect the performance of the metering component in a manner that will produce results that would correctly indicate the level of compliance of the metering component with this Code.*

Audit observation

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit commentary

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit outcome

Not applicable

5.73 On site metering component calibration records (Clause 9(3) of Schedule 10.8)

Code related audit information

An ATH that certifies a metering component on site must include confirmation in the metering component certification report that:

- it has calculated the uncertainty of measurement taking into account all environmental factors for both the metering component being calibrated and the working standards*
- the calculation of the uncertainty comprises all uncertainties in the chain of calibration*
- the ATH has used a calibration procedure to calibrate the metering component that was included in the ATH's most recent audit and is appropriate for on-site calibration.*

Audit observation

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit commentary

Trustpower conducts comparative recertification, but does not conduct onsite calibration of metering components.

Audit outcome

Not applicable

5.74 Data Storage Device Certification Expiry Date (Clause 37 of Schedule 10.7)

Code related audit information

Before certifying a meter installation which incorporates a data storage device, the ATH must determine the expiry date of the data storage device. The ATH must record the expiry date in the certification report for the metering installation and the certification report for the data storage device.

Audit observation

I checked the records for 22 metering installations to confirm compliance.

Audit commentary

Trustpower is correctly applying certification in accordance with this clause.

Audit outcome

Compliant

5.75 All Functions and Activities Must Be Completed (Clause 10.42(2))

Code related audit information

Where Part 10 requires the ATH to complete a function or activity before a metering installation is certified, the ATH must complete that function or activity as part of the process for certifying the metering installation.

Audit observation

I checked the records for 22 metering installations to confirm compliance.

Audit commentary

There was no evidence of incomplete functions.

Audit outcome

Compliant

6. INSPECTION OF METERING INSTALLATIONS

6.1 General Inspection Requirements (Clause 44 (1) (a) to (e) of Schedule 10.7)

Code related audit information

When carrying out an inspection of a metering installation, the ATH must:

- check and confirm that the data storage device in the metering installation operates as required*
- check and confirm that the expected remaining lifetime of each battery in the metering installation will be reasonably likely to meet or exceed the metering installation certification expiry date*
- ensure that no modifications have been made to the metering installation without the change having been documented and certification requirements satisfied*
- visually inspect all seals, enclosures, metering components, and wiring of the metering installation for evidence of damage, deterioration, or tampering*
- ensure that the metering installation and its metering components carry appropriate certification stickers.*

Audit observation

I checked the content of the standard inspection reports to confirm compliance.

Audit commentary

All of the other points above were checked on-site and recorded in the inspection report.

Audit outcome

Compliant

6.2 Raw Meter Data Test (Clause 44(1)(F) Of Schedule 10.7)

Code related audit information

When carrying out an inspection of a category 1 metering installation, the ATH must also check and confirm there is no difference between the volume of electricity recorded by the master accumulation register of a data storage device, and the sum of the meter registers.

Audit observation

Trustpower has not conducted any inspections where data storage devices are present.

Audit commentary

Trustpower has not conducted any inspections where data storage devices are present.

Audit outcome

Not applicable

6.3 Prepare Inspection Report (Clause 44(2) Of Schedule 10.7)

Code related audit information

An ATH must prepare an inspection report for each inspection of a metering installation that it carries out, which includes the following:

- details of the checks carried out, the results, and the installation certification expiry date
- the serial numbers of all components in the metering installation
- any non-compliances and the action taken to remedy the non-compliance
- the name of the inspector and the date on the inspection.

Audit observation

I checked the content of the standard inspection reports to confirm compliance.

Audit commentary

Trustpower's inspection reports contain most of the relevant information but does not contain the certification expiry date.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.3 With: Clause 44(2) Of Schedule 10.7 From: 01-Jan-17 To: 31-Jan-18	Inspection report does not record the installation expiry date. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because most fields are recorded. There is no impact on other participants or on settlement; therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Report form modified to include the installation expiry date		12/02/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Form modified		12/02/2018	

6.4 Provide Inspection Report To MEP (Clause 44(3) Of Schedule 10.7)

Code related audit information

The ATH must, within 10 business days of carrying out the inspection, provide the inspection report to the MEP.

Audit observation

I checked the timeframes for sending inspection reports to MEPs.

Audit commentary

Trustpower is also the MEP; therefore they have the records as soon as the inspection is complete. Compliance is achieved.

Audit outcome

Compliant

6.5 Inspections for Category 2 & Above Installations (Clause 46(2) of Schedule 10.7)

Code related audit information

When carrying out an inspection of a category 2 or higher metering installation, the ATH must also conduct the following additional checks:

- a visual inspection of each metering component in the metering installation for damage, tampering, or defect*
- if the current transformer can be safely accessed, check the position of the current transformer tap to ensure it is still appropriate for the expected maximum current for the metering installation*
- check for the presence of appropriate voltages at the metering installation*
- check the voltage circuit alarms and fault indicators.*

Audit observation

I checked Trustpower's process and standard report for Category 2 inspections.

Audit commentary

The process and reporting is compliant.

Audit outcome

Compliant

7. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

7.1 Investigation of Faulty Metering Installations (Clause 10.43(3) of Part 10)

Code related audit information

As a participant, the ATH must inform the MEP if it believes a metering installation is faulty, inaccurate, defective, or not fit for purpose.

Audit observation

I checked Trustpower's process documentation and reporting forms.

Audit commentary

Trustpower has a process which is compliant with the Code. The content of reporting includes all relevant detail.

Audit outcome

Compliant

7.2 Testing of Faulty Metering Installations (Clause 10.44 of Part 10)

Code related audit information

When advised by an MEP that a metering installation is faulty, inaccurate, defective, or not fit for purpose, the ATH must test the metering installation as soon as practical and provide a statement of situation.

Audit observation

I checked Trustpower's process documentation and reporting forms.

Audit commentary

Trustpower has a process which is compliant with the Code. The content of reporting includes all relevant detail.

Audit outcome

Compliant

7.3 Statement of Situation (Clause 10.46(1) of Part 10)

Code related audit information

The ATH must include the following in the statement of situation:

- *the details and results of the tests carried out*
- *a conclusion, with reasons, as to whether or not the metering installation is faulty*
- *an assessment of the risk to the completeness and accuracy of the raw meter data*
- *the remedial action proposed or undertaken*
- *any correction factors to apply to raw meter data to ensure that the volume information is accurate*
- *the period over which the correction factor must be applied to the raw meter data.*

Audit observation

I checked Trustpower's process documentation and reporting forms.

Audit commentary

Trustpower has a process which is compliant with the Code. The content of reporting includes all relevant detail.

Audit outcome

Compliant

7.4 Correction of Defects (Clause 10.47 of Part 10)

Code related audit information

When taking action to remedy an inaccuracy or defect within a metering installation, the ATH must ensure that records of any modifications that are carried out to the metering installation are kept for each metering component of the metering installation in the metering records and in a manner reasonable in the circumstances to ensure that further investigation can be carried out.

Audit observation

I checked Trustpower's process documentation and reporting forms.

Audit commentary

Trustpower has a process which is compliant with the Code. The content of reporting includes all relevant detail.

Audit outcome

Compliant

8. Conclusions

Eight non-compliances were identified by the audit. Seven of the eight relate to the format and content of certification and inspection reports and should be relatively easy to remedy. As shown in the non compliance table, one issue can appear in multiple sections, as is the case with the first four issues, which are all related to the content of the newly created AMI metering installation reports.

The main issue is the certification of 22 three phase installations where only one phase is metered. This certification is invalid and it will require the installation of three phase meters to resolve the non-compliance.

9. Trustpower Response

Trustpower thanks Veritek (Steve) for the audit process and his input into the review of our Test House compliance. As always the process has proven valuable either through reassurance of areas that Trustpower continues to operate well in, or the small recommendations of improvement.

Overall we are pleased with the findings of this audit and believe that Trustpower still operates a high performing ATH operations. On balance, we feel that the recommendation to extend our audit cycle to a minimum of 18 months would appropriately reflect how our business has performed and is tracking to perform for the next audit cycle.

Under the current audit regime, it is proving difficult to reduce the points attributed to the risk rating for an ATH that is performing transactions and events against several hundred thousand metering assets. We hope that our track record of performance and improvement is taken into account when assessing this audit report.