



# **Electricity Industry Participation Code Audit Report**

**For**



**Class B Approved Test House**

**Prepared by Brett Piskulic – Veritek Limited**

**Date of Audit: 12/04/19**

**Date Audit Report Complete: 10/05/19**

**Date Audit Report Due: 10/05/19**

## Executive Summary

Northpower 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 10 May 2019, in accordance with clause 1(4)(c) of schedule 10.3.

Ten non-compliances were identified by the audit and two recommendations are made.

Two relate to one issue, which is that Northpower has not confirmed the accuracy of CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard. The Authority provided a memo, dated 01/04/16, which clarified that burden resistance must be added in this situation and if not, then certification of the metering installations is cancelled.

There are six non-compliances which relate to missing information in metering installation certification reports.

Since the previous audit Northpower has put in place processes for the calibration and certification of meters. The calibration reports produced did not include a measurement uncertainty statement, this is recorded as 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 3 months.

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
Provision of Accurate Information	2.2	10.6	Provision of incomplete installation certification reports.	Moderate	Low	2	Identified

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	8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface. 6 of 21 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH.	Moderate	Low	2	Identified
Services access interface	3.5	10 of Schedule 10.4	8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface.	Moderate	Low	2	Identified
Meter requirements	3.11	26 (4) of Schedule 10.7	Seven metering installation certification reports did not contain the maximum interrogation cycle.	Moderate	Low	2	Identified
Maximum interrogation cycle	3.14	28 (3) of Schedule 10.7	Seven metering installation certification reports did not contain the maximum interrogation cycle.	Moderate	Low	2	Identified
Design Reports	5.3	2 (4) Of Schedule 10.7	Design Report not recorded in metering installation certification report in 13 cases out of 21 checked.	Moderate	Low	2	Identified
CT Burden	5.40	20(1)(b) of schedule 10.7	Northpower has not confirmed the accuracy of non-TWS CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard.	Weak	Low	5	Investigating
Determine Metering Component Error and Record	5.61	7(5) Of Schedule 10.4	Northpower has not confirmed that the measurement uncertainty does not exceed one third of the maximum permitted error when calibrating meters.	Weak	Low	5	Identified
Calibrating Metering Components	5.62	16A.20	Measurement uncertainty not recorded on meter calibration report.	Weak	Low	5	Identified

Subject	Section	Clause	Non compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Notification of metering installations not fit for purpose	7.1	10.43(3) of Part 10	MEP not notified that a metering installation with low burden was not fit for purpose and therefore has cancelled certification.	Moderate	Low	2	Investigating
Future Risk Rating						29	
Indicative Audit Frequency						3 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
Document Processes and Procedures	2.8	Clause 16 of Schedule 10.4	Ensure improved access to ATH processes and procedures.	Identified
Use of Metering Installation Certification Methods	5.9	7(1) of Schedule 10.7	Ensure certification method is clear in certification reports.	Identified

## Persons Involved in This Audit

Auditor:

Brett Piskulic

**Veritek Limited**

**Electricity Authority Approved Auditor**

Northpower personnel assisting in this audit were:

Name	Title
Peter Smith	Retail Billing Accountant
Marlon Palmer	Technician
Shane Ruxton	Commercial and Regulatory Manager
Liz Smith	Network Administrator

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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

Northpower 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 10 May 2019 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.

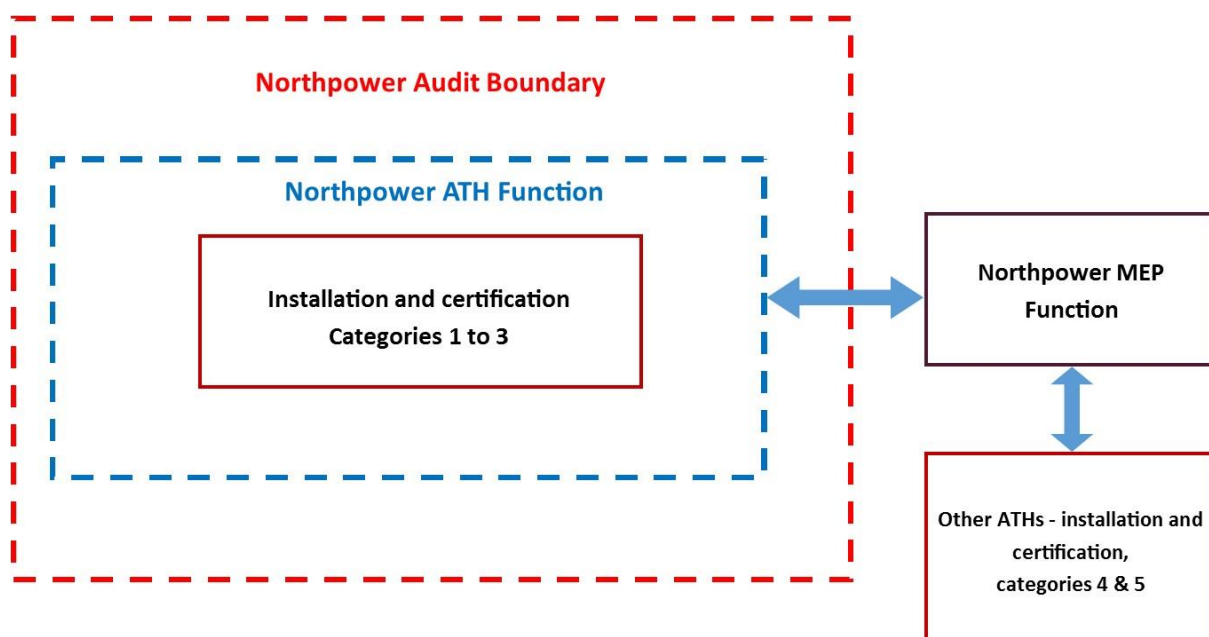
Northpower conducts field ATH activities for Categories 1 to 3 metering installations. This activity is for Northpower owned metering only.

Northpower 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) and (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.

Northpower 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.

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



### 1.3 Previous Audit Results

The last audit was conducted in May 2018 by Brett Piskulic of Veritek. The tables below show the findings:

### Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Provision of Accurate Information	2.2	10.6	Provision of incomplete installation certification reports.	Still existing
Metering installation type	3.2	8(2) of Schedule 10.7	13 of 29 Metering installation certification reports checked did not indicate the location of the services access interface. 20 of 29 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH.	Still existing
Services access interface	3.5	10 of Schedule 10.4	13 of 29 Metering installation certification reports checked did not indicate the location of the services access interface.	Still existing
Meter requirements	3.11	26 (4) of Schedule 10.7	Six metering installation certification reports did not contain the maximum interrogation cycle.	Still existing

Subject	Section	Clause	Non compliance	Status
Meter certification expiry date	3.12	27(5) of Schedule 10.7	Meter certification expiry date not recorded in a meter certification report.	Cleared
Maximum interrogation cycle	3.14	28 (3) of Schedule 10.7	Six metering installation certification reports did not contain the maximum interrogation cycle.	Still existing
Invalid certification	5.1	8(1) Of Schedule 10.7	29 metering installations certified without certification of the meters being completed.	
Selected component certification	5.18	11(3) Of Schedule 10.7	26 metering installations certified using selected component method without meters and data storage devices being certified. 26 metering installations certified using selected component method without component certification check being completed.	Cleared
Comparative Recertification	5.19	12(2) Of Schedule 10.7	3 metering installations certified using comparative recertification method without meters and data storage devices being certified.	Cleared
Comparative Recertification Tests	5.20	12(3) Of Schedule 10.7)	3 metering installations certified using comparative recertification method without component certification check being completed.	Cleared
Error Calculation	5.30	22 of Schedule 10.7	All sources of error not considered in calculation of measurement uncertainty for comparative recertification, in particular the effect of temperature variation on the working standard.	Cleared
Installation expiry dates	5.34	27(1) & (2) Of Schedule 10.7	Installations are being certified when meters have not been certified.	Cleared
Data storage device requirements	5.45	38(2) of schedule 10.7	Northpower is certifying metering installations containing data storage devices that have not been certified.	Cleared
Metering Component Certification	5.50	43(1) of Schedule 10.7	Northpower is certifying metering installations containing meters that have not been certified.	Cleared
Data Storage Device Certification	5.74	37 Of Schedule 10.7	Data storage devices are not being certified therefore the certification expiry date is not recorded in a data storage device certification report.	Cleared

Subject	Section	Clause	Non compliance	Status
All Functions and Activities Must Be Completed	5.75	Clause 10.42(2)	Northpower is not ensuring that metering components are certified in accordance with Part 10 prior to certifying metering installations.	Cleared

## Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Use of Metering Installation Certification Methods	5.9	7(1) of Schedule 10.7	Ensure certification method is clear in certification reports.	Still existing
Error calculation	5.30	22 of Schedule 10.7	Add allowance for effect of temperature to uncertainty calculations for comparative recertification.	Cleared
Measuring transformer certification	5.36	Clause 28(2) of Schedule 10.7	Add reference to the TWS CT certification report in the metering installation certification report.	Cleared

## Table of Issues

Issue	Description
-	-

## 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 if Northpower had used contractors to perform any of its ATH functions.

#### Audit commentary

I confirmed that all ATH activities are conducted by employees and not by contractors.

#### 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

As recorded in sections 3.2, 3.5, 3.11 and 3.14 Northpower has provided metering installation certification reports that are not complete as follows;

- 8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface.
- 6 of 21 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH.
- 7 of 21 metering installation certification reports did not contain the maximum interrogation cycle.

## Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.2 With: Clause 10.6 of Part 10 From: 10-May-18 To: 12-Apr-19	Provision of incomplete certification reports; 8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface. 6 of 21 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH. 7 of 21 metering installation certification reports did not contain the maximum interrogation cycle. Potential impact: Low Actual impact: Low Audit history: once 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
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the "Metering Installation Certification" report.		31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
The Network administration staff will check each "Metering Installation Certification" report for completeness when it is returned by the field staff. Any incomplete reports will be treated as "rework" and returned to the field staff member for completion before it is processed. The requirement to accurately and fully complete the report will be included in the "site visit tasks" process document as an on-going reminder to field staff.		31/7/2019	

## 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 Northpower during the audit period.

#### **Audit commentary**

Northpower 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**

Northpower 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**

Northpower has only conducted activities that fall within the scope of their approval. I have concluded from this audit that Northpower 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.
- Livening 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. Northpower has a procedure, SMS-014, for completing work on switchboards suspected of containing asbestos.
- General safety practices and the appropriate use and testing of personal protective equipment. Policy and instruction are clear in relation to this. The Northpower SMS-036 Personal protective equipment procedure covers use of all PPE. Technicians complete a SWMS (Safe Work Method Statement) form daily to identify and manage hazards and risks.

#### **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 scope was appropriate and that certification was in place.

#### **Audit commentary**

Northpower has ISO 9001:2015 registration for the Class B Test House. The scope is appropriate and includes the following statement:

“This registration also encompasses the operation of a Class B Test House.”

Northpower provided a copy of their most recent Integrated Management System Assessment Report conducted by Telarc in August 2018. The scope of this report included three standards - ISO 9001:2015; ISO 14001:2015, and AS/NZS 4801:2001. This report contained no areas of non-compliance or opportunities for improvement relevant to the Class B Test House activities.

#### **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**

Shane Ruxton has responsibility for the quality manager role. Marlon Palmer has responsibility for the role of technical manager. Both Shane and Marlon have appropriate qualifications and experience for these roles.

#### **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

Northpower uses a Sharepoint system known as Knowledge Central to store and provide access to its processes and procedures. Whilst all relevant documents are available in Knowledge Central, they are not always easy to locate. I have recommended that access to all documents related to the operation of the ATH is improved and that the documents are made available in one area.

The quality management system meets the requirements of the Code.

### Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Clause 16 of Schedule 10.4	Ensure improved access to ATH processes and procedures.	The new Test House management will raise a project to identify all documentation related to the Test House procedures and processes held in the Knowledge Central system. These documents will then be referenced to a Test House node so that they can be referenced from a single entity link.	Identified

## 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

Northpower does not operate a class A ATH.

### Audit commentary

Northpower does not operate a class A ATH.

### 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

Northpower has not conducted any material changes.

### Audit commentary

Northpower 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

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

### Audit commentary

Northpower 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

I checked the access to the laboratory and storage areas.

### Audit commentary

Access to the laboratory and storage area is restricted to authorised persons only.

#### **Audit outcome**

Compliant

### **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 21 certification reports.

#### **Audit commentary**

Northpower's process document (T&CM 2.1.33B) contains the appropriate instructions for the determination of compensation factors. The checks of 21 certification reports confirmed compensation factors were recorded accurately.

#### **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 Northpower's component stickers to confirm compliance.

#### **Audit commentary**

Northpower certifies meters and control devices and applies stickers which 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 examples of interference by Northpower 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 Northpower had certified any installations with loss compensation.

##### **Audit commentary**

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

##### **Audit outcome**

Not applicable

#### **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 21 certification reports to confirm compliance.

##### **Audit commentary**

Northpower's standard metering installation certification reports contain the relevant fields. However, this field is not always being populated. Of the 21 records I checked, six did not indicate whether the installation is HHR or NHH and eight did not indicate the location of the services access interface.

##### **Audit outcome**

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2</p> <p>With: Clause 8(2) of Schedule 10.7</p> <p>From: 12-Apr-18</p> <p>To: 12-Apr-19</p>	<p>8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface.</p> <p>6 of 21 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: once</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	<p>The controls are recorded as moderate because there is room for improvement.</p> <p>There is very little impact on other participants; therefore the audit risk rating is low.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the "Metering Installation Certification" report.		31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>The Network administration staff will check each "Metering Installation Certification" report for completeness when it is returned by the field staff. Any incomplete reports will be treated as "rework" and returned to the field staff member for completion before it is processed.</p> <p>The requirement to accurately and fully complete the report will be included in the "site visit tasks" process document as an on-going reminder to field staff.</p>		31/7/2019	

### 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 21 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

I checked with Northpower whether any different test points had been used.

#### Audit commentary

There were no different test points used other than those specified in the standards.

#### Audit outcome

Compliant

### 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 21 certification reports to confirm compliance.

#### Audit commentary

Northpower's standard metering installation certification reports contain the relevant fields. However, this field is not always being populated. Of the 21 records I checked 8 did not indicate the location of the services access interface.

#### Audit outcome

Non-compliant

Non-compliance	Description
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Audit Ref: 3.5 With: Clause 10 of Schedule 10.4  From: 10-May-18 To: 12-Apr-19	8 of 21 Metering installation certification reports checked did not indicate the location of the services access interface.  Potential impact: Low  Actual impact: Low  Audit history: Once  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
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the “Metering Installation Certification” report.	31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
The Network administration staff will check each “Metering Installation Certification” report for completeness when it is returned by the field staff. Any incomplete reports will be treated as “rework” and returned to the field staff member for completion before it is processed.  The requirement to accurately and fully complete the report will be included in the “site visit tasks” process document as an on-going reminder to field staff.	31/7/2019	

### 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 21 installation certification records to confirm compliance.

I checked the calibration and certification records for meters calibrated and certified by Northpower.

#### Audit commentary

Northpower had produced metering installation certification reports for the 21 installations I checked.

Northpower has produced a combined certification and calibration report for meters which it calibrates and certifies.

## Audit outcome

Compliant

### 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 21 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 21 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 21 metering records.

### Audit commentary

All records were provided within five business days. Metering installation certification reports are prepared in the field at the time of certification. The reports are returned to Northpower the following day.

### 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

Northpower has not certified any installations as a lower category.

### Audit commentary

Northpower has not certified any installations as a lower category.

### Audit outcome

Compliant

## 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 21 certification records.

### Audit commentary

As a Class B ATH, Northpower is unlikely to deal with any meters where maintenance is required. Northpower carries out a program of battery replacement for HHR meters. The details of this are recorded in the metering records.

I checked 21 certification reports to confirm if the maximum interrogation cycle is recorded. There were seven 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: 10-May-18 To: 12-Apr-19	Seven metering installation certification reports did 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		
<b>Low</b>	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
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the "Metering Installation Certification" report.		31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
The Network administration staff will check each "Metering Installation Certification" report for completeness when it is returned by the field staff. Any incomplete reports will be treated as "rework" and returned to the field staff member for completion before it is processed.  The requirement to accurately and fully complete the report will be included in the "site visit tasks" process document as an on-going reminder to field staff.		31/7/2019	

### 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 21 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

I checked the records for one installation containing current transformers. There were no maintenance requirements for these transformers.

#### Audit outcome

Compliant

### 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 21 certification reports to confirm the maximum interrogation cycle is recorded.

#### Audit commentary

I checked 21 certification reports to confirm the maximum interrogation cycle is recorded. There were seven certification reports where the maximum interrogation cycle was not recorded.

#### Audit outcome

Non-compliant

Non-compliance	Description
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Audit Ref: 3.14 With: Clause 28 (3) of Schedule 10.7  From: 10-May-18 To: 12-Apr-19	Seven metering installation certification reports did 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
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the “Metering Installation Certification” report.	31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
The Network administration staff will check each “Metering Installation Certification” report for completeness when it is returned by the field staff. Any incomplete reports will be treated as “rework” and returned to the field staff member for completion before it is processed.  The requirement to accurately and fully complete the report will be included in the “site visit tasks” process document as an on-going reminder to field staff.	31/7/2019	

## 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

I checked the environment used by Northpower when it is calibrating meters under its Class B ATH.

#### Audit commentary

As detailed in **section 5.62**, Northpower ensures that the environment is appropriate for calibration of meters under the Class B ATH.

#### 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 the test points to confirm compliance.

### Audit commentary

Northpower 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

Northpower 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

Northpower has an "instrument database" (MET-Team by Fluke) containing the records of all test equipment. This was checked during the audit and is up to date. Procedures are in place for the purchase of test equipment and consumables.

### 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

Northpower has a PWS2.3 Plus portable working standard and I checked the most recent calibration records.

### Audit commentary

Northpower has a PWS2.3 Plus portable working standard which has a current calibration report completed by Accucal.

#### **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 Northpower's working standard to confirm they had a current calibration report.

#### **Audit commentary**

Northpower's working standard has a current calibration report and has been calibrated at 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**

Northpower does not have a reference standard.

#### **Audit commentary**

Northpower does not have a reference standard. Northpower previously used a Radian reference standard, as they no longer operate a Class A laboratory this has been retired.

#### **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

Northpower is not a Class A ATH.

##### Audit commentary

Northpower is not a Class A ATH.

##### 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

Northpower calibrates meters using a working standard only.

##### Audit commentary

Northpower calibrates meters using a working standard only.

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

##### Audit commentary

Northpower 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

Northpower conducts comparative certification and the records contain sufficient information for the test to be replicated. I checked the calibration methods and records for meters calibrated under the Class B ATH.

##### Audit commentary

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

As detailed in **section 5.62**, Northpower follows 17025 calibration methods which ensure measurements are traceable.

##### 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 whether Northpower calibrates components in accordance with this clause.

##### Audit commentary

Northpower calibrates meters under its Class B ATH. As detailed in **sections 5.61 and 5.62**, Northpower follows 17025 calibration methods and uses appropriate test points. I have recorded non-compliance in **sections 5.61 and 5.62** as measurement uncertainty was not reported on the calibration report which I checked.

## Audit outcome

Compliant

### 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

Northpower has not certified any data storage devices.

#### Audit commentary

Northpower has not certified any data storage devices.

#### Audit outcome

Not applicable

### 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 Northpower's component stickers to confirm compliance.

#### Audit commentary

Northpower certifies control devices and meters, I confirmed that stickers are attached which are compliant with this clause.

#### 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 Northpower's component stickers to confirm compliance.

##### Audit commentary

Northpower certifies control devices and meters. I checked photos taken during installation and components in stock and confirmed that the stickers which had been applied meet the above requirements.

##### 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 21 certification records to confirm compliance.

##### Audit commentary

Northpower uses the wire and ferrule method for sealing. The sealing plier numbering system identifies Northpower as the ATH by using the NP prefix. The technician is identified by the sealing plier individual number which is recorded in the instrument database. The database periodically sends an email reminder to technicians to return the sealing pliers for inspection.

The metering installation certification reports contain confirmation of sealing and date of application of seals.

## 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 21 certification records.

#### Audit commentary

There was 1 Category 2 metering installation where the in-service burden was less than the lowest test point (25% of rated burden) and burden resistors were not installed. The Code states: 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.

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. Therefore the 17 installations mentioned above may not comply with some of the relevant clauses of Part 10. I have recorded non-compliance in **section 5.40** but I have not recorded non-compliance in this section because the installations are within the allowable 2.5%.

#### Audit outcome

Compliant

### 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 21 metering installations to confirm compliance.

#### Audit commentary

All 21 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 21 metering installations.

#### Audit commentary

I checked the design reports and confirm they are all compliant.

The design report was not recorded in the metering installation certification report for 13 of the 21 records I checked.

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 5.3 With: Clause 2 (4) Of Schedule 10.7  From: 10-May-18 To: 12-Apr-19	Design Report not recorded in metering installation certification report in 13 cases out of 21 checked.  Potential impact: Low  Actual impact: Low  Audit history: None  Controls: Moderate  Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	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
The new Test House management will meet with the field staff and Network administration staff to clarify the information that should be completed on the "Metering Installation Certification" report.		31/7/2019	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
The Network administration staff will check each "Metering Installation Certification" report for completeness when it is returned by the field staff. Any incomplete reports will be treated as "rework" and returned to the field staff member for completion before it is processed.  The requirement to accurately and fully complete the report will be included in the "site visit tasks" process document as an on-going reminder to field staff.		31/7/2019	

## 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 21 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

Northpower has not certified any installations as a lower category.

### Audit commentary

Northpower 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

Northpower has not certified any installations as a lower category.

### Audit commentary

Northpower 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

Northpower has not certified any installations as a lower category.

### Audit commentary

Northpower 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

Northpower has not certified any installations as a lower category.

### Audit commentary

Northpower 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 21 metering installations to confirm compliance.

### Audit commentary

The certification records confirm that Northpower has used the Selected component and Comparative recertification methods for certification of category 1 and 2 metering installations. The methods used have been used appropriately though are not always clearly identified on the metering installation certification reports. I recommend that the method of certification is clearly identified on the metering installation certification reports.

### Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Clause 7(1) of Schedule 10.7	Ensure certification method is clear in certification reports.	The Metering Installation Certification Report will be amended to include reference to the method of certification.	Identified

## 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

Northpower conducted comparative recertification of one category 2 metering installation during the audit period. I checked the certification records for this installation.

There was no statistical sampling recertification completed during the audit period.

### Audit commentary

Northpower used the comparative recertification method for one category 2 metering installations in accordance with clause 12 of schedule 10.7.

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

Northpower has not conducted certification of installations above Category 2.

### Audit commentary

Northpower 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 21 certification reports to confirm compliance.

#### **Audit commentary**

Northpower's documented procedures (MetAMP 1.1.20 and T&CM 2.1.33B) achieve compliance with these requirements.

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

Prevailing load tests for category 2 certification are conducted using a PWS2.3 Plus working standard.

- Prevailing load tests must be conducted on a metering installation or metering component by using a working standard connected to the metering installation. Northpower 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 technicians ensure that the meter installed has the configuration matching that in the design report.
- 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.
- 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.

Northpower has not certified any Category 1 AMI installations.

For category 2 HHR installations Northpower compares the results from a working standard with the raw meter data from the data administrator for a half hour period while on site.

- 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. Northpower 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. Northpower 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 21 certification reports to confirm compliance.

#### Audit commentary

For category 2 HHR installations Northpower obtains the data from the back office system and compares this with the output from the working standard.

The Northpower ATH does not certify any AMI category 1 installations.

#### 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 21 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 21 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 20 metering installations to confirm compliance.

#### Audit commentary

The process documentation is clear, and the selected component method was appropriate in accordance with table 1 of schedule 10.1 for the 20 installations certified.

#### **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 20 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 one metering installation to confirm compliance.

#### **Audit commentary**

I confirmed that the current transformers expire before the meter in this installation. The certification records confirmed that the meter and data storage device had been calibrated and certified.

#### **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 one metering installation to confirm compliance.

### Audit commentary

The certification reports confirmed that testing was conducted and that the total accuracy was within the requirements of table 1.

### 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

Northpower does not conduct certification under this clause.

### Audit commentary

Northpower 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

Northpower does not conduct certification under this clause.

### Audit commentary

Northpower 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

Northpower does not conduct certification under this clause.

### Audit commentary

Northpower 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

Northpower does not conduct certification under this clause.

### Audit commentary

Northpower 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

Northpower has not conducted insufficient load certification during the audit period.

### Audit commentary

Northpower has not conducted insufficient load certification during the audit period. The Northpower technicians use a load bank to ensure that sufficient load is available when certifying category 2 installations.

### 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**

Northpower has not conducted statistical sampling recertification during the audit period.

#### **Audit commentary**

Northpower has not conducted statistical sampling recertification during the audit period.

#### **Audit outcome**

Not applicable

### **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**

Northpower has not conducted statistical sampling recertification during the audit period.

#### **Audit commentary**

Northpower has not conducted statistical sampling recertification during the audit period.

#### **Audit outcome**

Not applicable

### **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 21 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 21 metering installation certification records to confirm compliance.

### Audit commentary

The process documentation stipulates the maximum permitted errors for certification. Northpower applies a 2% limit to cat 2 installations. 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 the certification records for one metering installation and discussed the process for error calculation.

### Audit commentary

Northpower's methodology includes the calculation of measurement uncertainty associated with the working standard and clamp on CTs. The error measurements are recorded in the metering installation certification reports. The calculation considers all sources of measurement error, in particular there is an allowance for the effect of temperature variation on the working standard over the range of temperature experienced on site.

### 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 1 metering installation certification record, and process documentation.

### Audit commentary

Northpower's process document (T&CM 2.1.33B) contains the appropriate instructions for the determination 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. Northpower 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 one metering installation certification record, and process documentation.

### Audit commentary

Northpower's process document (T&CM 2.1.33B) contains the appropriate instructions for the determination 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. Northpower 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. Northpower has a compliant documented procedure (TCM 2.1.10) for 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 21 certification records to confirm compliance.

#### Audit commentary

All meter and metering installation certification expiry dates were correct.

#### Audit outcome

Compliant

#### 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

Northpower does not install any electromechanical meters.

##### Audit commentary

Northpower does not install any electromechanical meters.

##### 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

Northpower did not perform any certifications at category 2 or above using the selected component method.

##### Audit commentary

The Northpower process is to install TWS CTs, which are pre-certified by TWS, in new category 2 installations.

##### 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 one certification record, and process documentation to confirm compliance.

#### **Audit commentary**

The Northpower process documentation (T&CM 2.1.10) and design reports stipulate all of the relevant requirements above. The certification report confirmed compliance with regard to certification and burden. The checklist included in the certification reports confirms transparent covers were used and that seals are applied.

#### **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**

Northpower certified one installation only with measuring transformers. This installation was certified using the comparative recertification method so the current transformers were not certified.

#### **Audit commentary**

Northpower certified one installation only with measuring transformers. This installation was certified using the comparative recertification method so the current transformers were not certified.

#### **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 Northpower ATH operation, and no examples were available to review.

#### **Audit outcome**

Compliant

### **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 one category 2 metering installation 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. Most new CTs are manufactured and certified by TWS. TWS has conducted testing and confirmed that CTs with ratios of 500/5 or greater will not be affected by low burden. Those under 500/5 may be affected by low burden.

For new installations and CT replacements Northpower is purchasing CTs with a rated burden of 2.5VA. This ensures that the in-service burden will be within the calibrated range of the CTs.

Northpower confirms the in-service burden during certification and re-certification, but they are not installing burden resistors where the in-service burden is less than 25%.

One installation was identified where the burden is less than 25%. In this case, the total installation error was within the allowable threshold, but Northpower has not confirmed that these CTs will operate accurately with this in-service burden. Certification is cancelled for this installation. Non-compliance is also recorded in section 7.1 for not notifying the relevant MEP that the installations are not fit for purpose.

### Audit outcome

#### Non-compliant

Non-compliance	Description		
Audit Ref: 5.40 With: Clause 20(1) (b) Of Schedule 10.7  From: 10-May-18 To: 12-Apr-19	Northpower has not confirmed the accuracy of non-TWS CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard.  Potential impact: Medium  Actual impact: Low  Audit history: None  Controls: Weak  Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	There is currently no process in place to resolve low burden issues.  The impact on settlement is likely to be minor because the overall error of the installation was measured and recorded, and was within 2.5%		
Actions taken to resolve the issue		Completion date	Remedial action status
The new Test House management will discuss this requirement with the technical staff and, if necessary, the auditor to gain a better understanding of what is required when category 2 and above metering installations are certified with regard to CT burdening.  A procedure document will then be produced to provide guidance to the field staff in the small number of cases where a category 2 or higher site is being certified.		31/7/2019	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	

The paperwork completed by the field staff when certifying a category 2 or above metering installation will be checked by the Network administration staff to ensure that it is fully completed for the specialized tests.	31/7/2019	
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#### 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

Northpower has not applied alternative certification.

##### Audit commentary

Northpower has not applied alternative certification.

##### Audit outcome

Compliant

#### 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 12 metering installations to confirm compliance.

##### Audit commentary

Northpower is certifying control devices. The control device certification expiry date is the same as the installation expiry and is correctly recorded in the installation certification report. The metering

installation certification report has a checkbox to verify that the device is likely to receive a signal. 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**

Northpower only operates on the Northpower network which has low frequency plant. It has been confirmed there are no signal propagation issues on the network.

#### **Audit commentary**

Northpower only operates on the Northpower network which has low frequency plant. It has been confirmed there are no signal propagation issues on the network.

#### **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 one metering installation to confirm compliance.

#### **Audit commentary**

No data storage devices were reinstalled by Northpower. All data storage devices which are installed by Northpower are integral to meters. All meters installed by Northpower have been calibrated prior to installation.

#### **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 data storage device certification reports, type test reports, and processes for determining environmental suitability.

##### Audit commentary

Northpower certified one category 2 metering installation which contained a data storage device. The data storage device was integral to the meter and was certified as part of the meter certification. I checked the certification records and confirmed that the points above are met.

##### 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 4 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 Northpower whether this scenario had arisen.

##### Audit commentary

This scenario has not arisen and is unlikely to arise.

##### Audit outcome

Compliant

#### 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 4 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 records for 21 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 metering installation certification reports contain a section on the suitability of metering enclosures. Northpower has an appropriate sticker for CT chambers, the metering installation certification report contains fields to confirm the application of labels.

#### **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 certification and storage of components, and the records for 21 metering installations to confirm compliance.

#### **Audit commentary**

Northpower conducts calibration of components in their laboratory for meters which are returned from metering installations and they have appropriate arrangements for storage and transportation. Northpower is ensuring components are certified as required by the Code.

#### **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 records for 21 metering installations to confirm compliance.

#### **Audit commentary**

The process documentation achieves compliance with all of the requirements above. There are fields on the metering installation certification reports for the technicians to confirm the application of seals

and date of application. I checked the records for 21 metering installations, and I confirm that all components and enclosures were appropriately sealed. Main switches are sealed where this is possible. I checked the sealing tool number for a technician to ensure this was correctly recorded in the sealing tool register to enable tracking of the person who applied any given seal.

#### **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, metering records and photos for 4 metering installations to confirm compliance.

#### **Audit commentary**

The process documentation, metering records and the photos for 4 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 and metering records for 21 metering installations to confirm compliance.

#### **Audit commentary**

Northpower uses the wire and ferrule method for sealing. The sealing plier numbering system identifies Northpower as the ATH by using the NP prefix. The technician is identified by the sealing plier individual number which is recorded in the instrument database. The instrument database was confirmed as accurate and up to date.

The date of application of the seal is recorded in the metering installation certification report.

#### **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. I also checked if there were any examples of seals requiring replacement.

### Audit commentary

Northpower has appropriate instructions in relation to this requirement and there is the ability to record this information in the metering installation certification report for the installation.

There were 10 cases identified during category 1 inspections where seals were found to be missing or not intact. The ATH replaced the seals after performing checks to determine the continued integrity and accuracy of the installations.

### 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 metering installation certification reports for 21 metering installations to confirm compliance.

### Audit commentary



The process documentation, design reports and metering installation certification reports confirm compliance. There are checkboxes in the metering installation certification report to confirm that the technician has checked the wiring and that it matches the design report.

#### **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 metering installation certification report for 1 category 2 metering installation 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 21 certification records to confirm compliance.

#### **Audit commentary**

Northpower ensures that all meters and current transformers have been calibrated prior to certification of the metering installation. Components are not issued for installation unless they have been calibrated and certified.

#### **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 the Northpower processes for certification of metering components.

### Audit commentary

Northpower ensures that meters are calibrated in accordance with the appropriate standards prior to certification.

### 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

Northpower's Class B ATH calibrates meters which have been returned from installations prior to the meters being certified and made available for reinstallation. I checked the process documentation and calibration records for 38 meters.

### Audit commentary

The Northpower calibration methodology follows the relevant requirements of ISO17025, this is verified by this audit. See **section 5.62**. I have recorded non-compliance in **sections 5.61 and 5.62** as measurement uncertainty was not reported on the calibration records which I checked.

### Audit outcome

Compliant

## 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

I checked the test points used by Northpower.

### Audit commentary

Northpower uses the test points stipulated in the relevant standards.

## Audit outcome

Compliant

### 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

I checked the uncertainty of measurement reported on the Northpower calibration reports met the above requirements.

#### Audit commentary

The calibration report I checked for single phase meters did not contain an uncertainty statement. It is not possible to determine that the reported measurement uncertainty did not exceed one third of the maximum permitted error from the relevant standard. This is recorded as non-compliance.

## Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.61 With: Clause 7(5) Of Schedule 10.4  From: 10-May-18 To: 12-Apr-19	Northpower has not confirmed that the measurement uncertainty does not exceed one third of the maximum permitted error when calibrating meters.  Potential impact: Medium  Actual impact: Low  Audit history: None  Controls: Weak  Breach risk rating: 5
Audit risk rating	Rationale for audit risk rating
<b>Low</b>	There is currently no process in place to record uncertainty on calibration reports.  The impact on settlement is likely to be minor because the overall error measured and recorded was well below the maximum allowed.
Actions taken to resolve the issue	
Completion date	Remedial action status

The new Test House management will discuss this issue with the Test House technical staff. A review of the calibration reports will be made and the reports modified to include an uncertainty statement.	31/7/2019	Identified
<b>Preventative actions taken to ensure no further issues will occur</b>	<b>Completion date</b>	
Meter calibration reports will be periodically reviewed to ensure they are being fully completed.	31/7/2019	

## 5.62 Class B ATH Calibrating Metering Components (Clause 16A.20)

### Code related audit information

*A class B ATH must ensure that the auditor audits the class B ATH in respect of the requirements of NZ/AS ISO 17025 for calibration that apply to the performance of the functions for which the class B ATH is being audited.*

### Audit observation

I checked the process documentation and calibration records for 38 meters.

### Audit commentary

I confirmed that the following ISO 17025 requirements were met;

- The laboratory environment is appropriate and temperature is maintained at 21 degrees Celsius +/- 2 degrees.
- The working standard has been calibrated, and has a current calibration report which is traceable to national standards.
- Technical personnel are appropriately qualified and trained.
- The calibration methods and test points used are appropriate.
- The quality system has been audited during the ISO9001 audit and is appropriate.
- The calibration reports contain relevant information and are stored and controlled appropriately.

The calibration report I checked did not contain a measurement uncertainty statement. It is an ISO 17025 requirement that measurement uncertainty is determined and reported on calibration reports. This is recorded as non-compliance.

### Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.62 With: Clause 16A.20  From: 10-May-18 To: 12-Apr-19	Measurement uncertainty not recorded on meter calibration report. Potential impact: Medium Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 5

Audit risk rating	Rationale for audit risk rating		
Low	<p>There is currently no process in place to record uncertainty on calibration reports.</p> <p>The impact on settlement is likely to be minor because the overall error measured and recorded was well below the maximum allowed.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
The new Test House management will discuss this issue with the Test House technical staff. A review of the calibration reports will be made and the reports modified to include an uncertainty statement.		31/7/2019	Choose an item.
Preventative actions taken to ensure no further issues will occur		Completion date	
Meter calibration reports will be periodically reviewed to ensure they are being fully completed.		31/7/2019	

#### 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 21 metering installations and the type test reports to confirm compliance.

##### Audit commentary

All meters are certified, Northpower has obtained type test reports for all meters used. The type test numbers are recorded on the meter certification reports.

##### 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

Northpower does not relocate meters without the meter being recalibrated. Northpower limits the certification period of metering installations used for builder's temporary supplies to 12 months.

### 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

Northpower 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

Northpower 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

Northpower 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

Northpower 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**.

### Audit outcome

Non-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

Northpower 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

Northpower 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 12 metering installations to confirm compliance.

### Audit commentary

Northpower 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 processes and the records for 21 metering installations to confirm compliance.

### Audit commentary

No data storage devices were reinstalled by Northpower. All data storage devices which are installed by Northpower are integral to meters. All meters installed by Northpower have been calibrated 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**

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

#### **Audit commentary**

Northpower 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**

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

#### **Audit commentary**

Northpower 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**

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

### **Audit commentary**

Northpower 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 1 metering installation containing a data storage device to confirm compliance.

### **Audit commentary**

The data storage device certification expiry date was correctly calculated and recorded in the metering installation certification report.

### **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 21 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 10 completed inspection reports and reviewed the results of 125 category 1 inspections which were completed between July and September 2018 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

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

#### Audit commentary

Northpower 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 10 completed inspection reports and reviewed the results of 125 category 1 inspections which were completed between July and September 2018 to confirm compliance.

#### **Audit commentary**

Northpower's inspection reports contain all of the relevant information.

#### **Audit outcome**

Compliant

### **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**

Northpower 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**

Northpower did not conduct any inspections of category 2 & above installations during the audit period.

#### **Audit commentary**

Northpower did not conduct any inspections of category 2 & above installations during the audit period.

#### **Audit outcome**

Not applicable

## 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 Northpower's process documentation and reporting forms.

#### Audit commentary

Northpower has a process which is compliant with the Code. The content of reporting includes all relevant detail. No specific examples of faulty metering installations have been identified.

I have considered whether Northpower was required to notify the MEP that the installation mentioned in section 5.40 was not fit for purpose. The installation in question is deemed to be "not fit for purpose" because of low CT burden, therefore certification is cancelled.

The Authority has clarified that non-compliance exists and that certification is cancelled for installations where low burden is not addressed, therefore I have concluded that Northpower should have notified the MEP.

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 7.1 With: Clause 10.43(3) Of Part 10  From: 10-May-18 To: 12-Apr-19	MEP not notified that a meter installation with low burden are not fit for purpose and therefore have cancelled certification.  Potential impact: Medium  Actual impact: Medium  Audit history: None  Controls: Moderate  Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement.  The impact on settlement and participants is minor, therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status

<p>The new Test House management will discuss this requirement with the technical staff and, if necessary, the auditor to gain a better understanding of what is required when category 2 and above metering installations are certified with regard to CT burdening.</p> <p>This ICP will be identified and the certification report will be reviewed so that appropriate action can be taken to remedy the situation. Note that Northpower Test House completes metering work solely for Northpower MEP, no other MEPs are affected.</p>	31/7/2019	Investigating
<p><b>Preventative actions taken to ensure no further issues will occur</b></p>	<p><b>Completion date</b></p>	
<p>The paperwork completed by the field staff when certifying a category 2 or above metering installation will be checked by the Network administration staff to ensure that it is fully completed for the specialized tests.</p>	31/7/2019	

## 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 Northpower's process documentation and reporting forms.

### Audit commentary

Northpower has a process which is compliant with the Code. The content of reporting includes all relevant detail. No specific examples of faulty metering installations have been identified.

### 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 Northpower's process documentation and reporting forms.

#### Audit commentary

Northpower has a process which is compliant with the Code. The content of reporting includes all relevant detail. Northpower has not been requested to provide a statement of situation.

#### 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 Northpower's process documentation and reporting forms.

#### Audit commentary

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

No specific examples of faulty metering installations have been identified.

#### Audit outcome

Compliant

## **8. Conclusions**

Ten non-compliances were identified by the audit and two recommendations are made.

Two relate to one issue, which is that Northpower has not confirmed the accuracy of CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard. The Authority provided a memo, dated 01/04/16, which clarified that burden resistance must be added in this situation and if not, then certification of the metering installations is cancelled.

There are six non-compliances which relate to missing information in metering installation certification reports.

Since the previous audit Northpower has put in place processes for the calibration and certification of meters. The calibration reports produced did not include a measurement uncertainty statement, this is recorded as non-compliance.



## 9. Northpower Response

For the past few years, the Northpower Contracting Division has managed the Northpower Class B Test House function as they also employed the field staff who installed the Northpower owned legacy meters.

There is now a greatly reduced number of ICPs that have Northpower legacy metering on site as a result of traders advanced meter roll-out programs, and no newly livened ICPs have Northpower owned metering. Due to the reduction in metering field work needing to be completed for the Northpower MEP, the Northpower Contracting Division has restructured the inspections team that were involved in the metering field work.

As part of this restructure the Northpower Contracting Division made a decision to no longer manage the Northpower Class B Test House. As Northpower MEP still retains obligations under the Code relating to expired, and future expiring, meters it was decided to transfer management of the Northpower Class B test House to the Network Commercial Team effective 1 April 2019.

This audit occurred soon after the Commercial Team took over management of the Class B Test House and has been a great help in identifying some issues that will need to be addressed by the Team as they tackle the challenge of managing a Class B Test House.

Many of the non-compliances noted relate to the field staff not fully completing the “Metering Installation certification” paperwork fully and accurately. This should be easy to address as the base documentation does include all required fields so a meeting will be arranged with the field staff to ensure they understand the importance of properly completing the paperwork. The Commercial Team administration staff will be trained to review the completed paperwork as it is returned by the field staff for completeness and any cases of missing information will be sent back to the field staff as “rework”.

There are some technical non-compliances involving CT burdening and uncertainty calculations which the new management will need to gain an understanding of. These technical issues will be discussed and resolved in co-operation with the Test House Technical staff who remain from when the Test House was managed by the Northpower Contracting Division.

The effect of the non-compliance issues noted is minimised by the fact that the Northpower Class B Test House only carries out work for the Northpower MEP function which retains responsibility for the small number of ICPs with Northpower legacy metering.