

Electricity Industry Participation Code Audit Report

For



Class B Approved Test House

Prepared by Steve Woods – Veritek Limited

Date of Audit: 19/05/20

Date Audit Report Complete: 22/06/20

Date Audit Report Due: 29/06/20

Executive Summary

Nova 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 29 June 2020, in accordance with clause 1(4)(c) of schedule 10.3.

Nova conducted a comprehensive review of the ATH operation after the previous audit and as a result several updates to processes and documentation were made. Nova had a target of achieving 100% compliance during this audit and the target was met. The audit found compliance with all relevant clauses of the code. A small number of recommendations for improvement were made during the audit, which were all adopted prior to the finalisation of this report.

Category 2 certification compliance has proved problematic for the industry in general, however Nova demonstrated robust practices for the measurement of uncertainties and the management of in-service burden.

The management and control of field contractors has improved, with additional emphasis on the review of on-site photos and certification records.

The Class B laboratory has not been used for calibration purposes while Nova has been reviewing and improving the management of uncertainties, in liaison with MSL. The laboratory is close to being fully operational again.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The future risk rating table provides some guidance on this matter and recommends a next audit frequency of 36 months. I agree with this recommendation.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			Nil				
Future Risk Rating						0	
Indicative Audit Frequency						36 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
			Nil	

Persons Involved in This Audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Nova personnel assisting in this audit were:

Name	Title
Mike Geddes	Test House Manager
Mike Bridge	ATH Technical Manager
Lee Walker	ATH Quality Manager

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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

Nova 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 29 June 2020 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.

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

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

- (a) calibration of class 0.5 meters, class 1 meters and class 2 meters, and class 0.5 current transformers and class 1.0 current transformers, provided that the calibrations are carried out under their approved quality certification and in accordance with this Part, and included within the ATH audit for approval:
- (b) installation and modification of metering installations:
- (c) installation and modification of metering components:
- (d) calibration of metering components on site:
- (e) certification, using the selected component certification method, of:
 - (i) category 1 metering installations:
 - (ii) category 2 metering installations:
 - (iii) category 3 metering installations with a primary voltage of less than 1kV:

(g) certification, using the comparative recertification method, of category 2 metering installations:

(h) issuing of certification reports in respect of certifications of metering installations under paragraphs (e) to (g):

(i) inspection of:

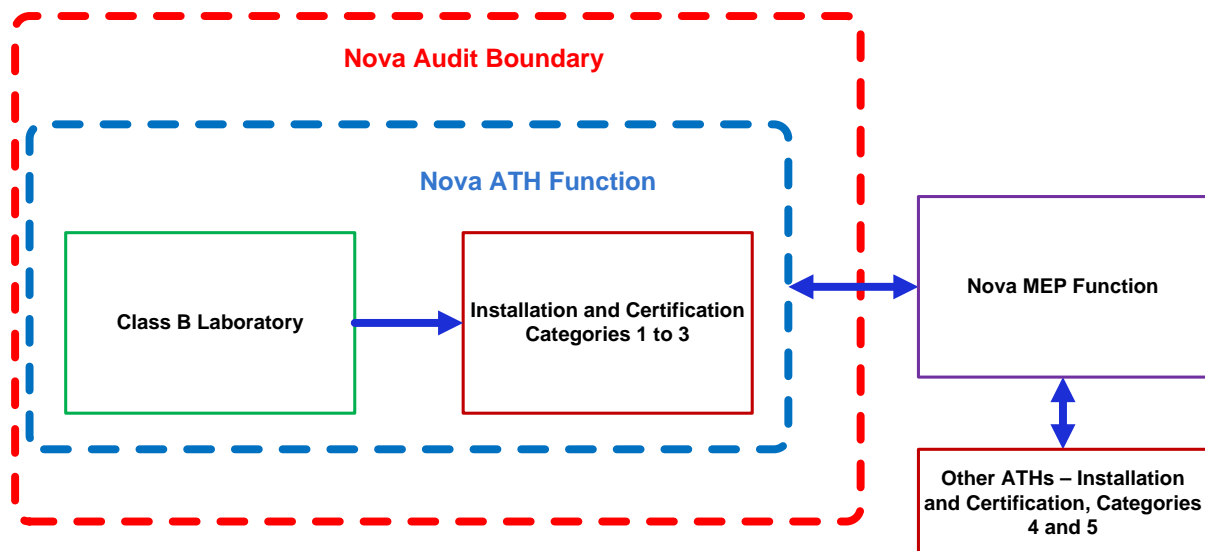
(i) category 1 metering installations:

(ii) category 2 metering installations:

(iii) category 3 metering installations with a primary voltage of less than 1kV.

Nova 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 2019 by Steve Woods of Veritek. The table below shows that all three non-compliances have been cleared.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Contractor audits	2.1	10.3 of Part 10	Contractor audit regime policy not followed for approx. 18 months.	Cleared
Determine Metering Component Error and Record	5.61	7(5) Of Schedule 10.4	Nova has not confirmed that the measurement uncertainty does not exceed one third of the maximum permitted error when calibrating meters.	Cleared
Calibrating Metering Components	5.62	16A.20	Measurement uncertainty not recorded on meter calibration report.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
			Nil	

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

Audit commentary

Nova has a number of subcontractors operating under their Test House; a database is maintained with all relevant details; including driver's license and sealing pliers, registration, competence and training records.

Initial training includes instruction on "standard operating procedures" (SOPs) and health & safety. Technicians sign that they have received the information and the trainer signs off on the training record once the technician is deemed competent.

The previous audit recorded non-compliance because Nova had not followed their own policy of auditing 5% of completed jobs with a minimum of two audits per quarter per contractor. The policy has now changed. A standard set of photos is now required for every metering installation and all photos are checked along with the certification records. A master schedule records any issues with any of the field work or the certification records. I checked the photos for 46 metering installations, and I checked the master schedule of results. This process achieves compliance with the requirement that the ATH *"must ensure that the contractor has at least the specified level of skill, expertise, experience, or qualification that the participant would be required to have if it were performing the obligation itself"*.

Audit outcome

Compliant

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

I did not identify any examples of non-compliance with this clause.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

Nova 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

Nova 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

Nova has only conducted activities that fall within the scope of their approval. I have concluded from this audit that Nova has met the requirements of this clause. I checked compliance with other enactments, specifically the electricity regulations with regard to the following safety practices:

- Access to basic insulation. Nova's policy is to leave the installation as it was found, provided there are no hazards. Nova will sleeve conductors if it is deemed necessary. The instructions include a statement about technician's responsibilities as electricians with reference to AS/NZS 3000.
- Liveness practices, specifically polarity testing. Earth loop impedance is tested, and liveness is not conducted for new connections if the tests are not passed. Trailing earth leads are used to check polarity on new connections. For existing installations with meter changes, the conductors are labelled to ensure correct reconnection. Shunt neutrals are used so there is no risk of reversed polarity as part of a meter change.
- Safety practices with regard to the management of asbestos switchboards. Work on asbestos boards is currently on hold whilst consultation occurs with Worksafe and 3M regarding a revised and approved process.

- General safety practices and the appropriate use and testing of personal protective equipment. During the previous audit period, Nova had engaged an expert to assist with a review of all H&S policies and procedures. Hazard ID forms must be completed for each job. Minimum PPE requirements are regularly reinforced; they include overalls, safety footwear and safety glasses, plus gloves for work near live conductors. Whole current meter changes are not conducted live.

Nova has detailed processes in place for all four points mentioned above. In addition, they have a process for the management of Zellweger ZE22/3 relays, which contain radioactive materials.

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

Nova has ISO 9001:2008 registration for the Class B Test House. The scope is appropriate and includes the following statement:

“...the operation of a Class B approved test-house in accordance with the Electricity Authority Electricity Industry Participant Code Part 10 Metering Rules...”

The most recent report, dated April 2020, did not contain any non-conformances. There were three minor opportunities for improvement.

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

Lee Walker has responsibility for the quality manager role. Mike Bridge has responsibility for the role of technical manager. Both Lee and Mike 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

Nova has a comprehensive set of SOPs, which I reviewed during the audit.

The quality management system meets the requirements of the Code.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Nova does not operate a class A ATH.

Audit commentary

Nova 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

Nova has not conducted any material changes.

Audit commentary

Nova 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

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

Audit commentary

Nova 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

There is an “authority and access” database and it contains a list of personnel authorised to access the laboratory. Access is also restricted by a swipe card system.

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 46 certification reports.

Audit commentary

Nova has documented instructions for determining compensation factors. The multiplier and ratio are both populated on the commissioning form.

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 Nova’s component stickers to confirm compliance.

Audit commentary

Nova 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 Nova during the audit. Nova does not conduct any activities without a works order.

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 Nova had certified any installations with loss compensation.

Audit commentary

Nova 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 46 certification reports to confirm compliance.

Audit commentary

Nova's standard metering installation certification reports contain the relevant fields, which were correctly populated for the sample checked.

Audit outcome

Compliant

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 46 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 Nova whether any different test points had been used.

Audit commentary

Nova's test points included the minimum required by Table 5 and they also test at additional test points. Nova does not calibrate measuring transformers.

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 46 certification reports to confirm compliance.

Audit commentary

Nova's standard metering installation certification reports contain the relevant fields, which were correctly populated for the sample checked.

Audit outcome

Compliant

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 46 installation certification records to confirm compliance. I checked the calibration and certification records for meters calibrated and certified by Nova.

Audit commentary

Nova produced metering installation certification reports for the 46 installations I checked.

Nova has previously produced calibration reports for meters which it calibrates and certifies. The laboratory was not used to calibrate and certify components during the audit period because the uncertainty calculations are being updated. The laboratory is used to test faulty metering and for other testing purposes but not to calibrate.

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 46 metering installations along with the storage practices.

Audit commentary

All records were available, and records are stored indefinitely. The standard operating procedure clarifies the requirements. I also checked whether certification records could be edited or altered. Nova has a strict policy that only minor changes can be made to certification reports and only to certain fields; no test results are changed and there is an audit trail of any changes. The original record is saved, and the altered record is provided back to the technician. I checked an example to confirm compliance.

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 46 metering installations along with the storage practices.

Audit commentary

All records were available, and records are stored indefinitely. I checked some records from 2016 to confirm compliance.

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 processes for metering records.

Audit commentary

All certification activities are conducted for Nova MEP; therefore, the MEP has the records as soon as the ATH has the records. I checked 10 certification reports to confirm the number of days from certification to saving of the record was less than 10 business days. Compliance is confirmed.

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

Nova has not certified any installations as a lower category.

Audit commentary

Nova 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 46 certification records.

Audit commentary

As a Class B ATH, Nova is unlikely to deal with any meters where maintenance is required.

I checked 46 certification reports to confirm if the maximum interrogation cycle is recorded. The maximum interrogation cycle was correctly recorded in all cases.

Audit outcome

Compliant

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 46 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 46 certification reports to confirm the maximum interrogation cycle is recorded.

Audit commentary

The maximum interrogation cycle was correctly recorded in all cases.

Audit outcome

Compliant

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 Nova when it is calibrating meters under its Class B ATH.

Audit commentary

As detailed in **section 5.62**, Nova 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

Nova 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

I checked Nova's records to confirm compliance.

Audit commentary

Nova has records of all standards and their history, including any maintenance and repairs.

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

I checked the calibration reports for all standards.

Audit commentary

Nova's records were examined to confirm current calibration for the following devices:

- two MTE PWS 2.3 working standards (Category 2 in-situ test instruments) have current calibration until January 2021,
- two MTE PWS 3.3 working standards (used for the test bench) have current calibration until January 2021, and
- three thermometers, which were calibrated in December 2019 for 12 months.

Proficiency testing (confidence testing) is conducted every six months against an EDM1 Mk6E reference meter.

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 Nova's working standards to confirm they have current calibration reports.

Audit commentary

Nova's working standards have current calibration reports and have 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

I checked the records for Nova's reference meter used for proficiency testing.

Audit commentary

Proficiency testing (confidence testing) is conducted every six months against an EDM1 Mk6E reference meter. The reference meter is calibrated every three years and has a current calibration report.

Audit outcome

Compliant

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

Nova is not a Class A ATH.

Audit commentary

Nova 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

Nova has a test bench and I checked the records for the standards, as mentioned in **section 4.4**.

Audit commentary

The test bench standard has current calibration.

Audit outcome

Compliant

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

Audit commentary

Nova 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

Nova 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

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

As detailed in **section 5.62**, Nova 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 Nova calibrates components in accordance with this clause.

Nova does not calibrate CTs.

Audit commentary

Nova has a Class B laboratory. I recorded non-compliance in the previous audit report because measurement uncertainty was not calculated and reported in calibration reports. Nova has not calibrated any meters for compliance during the audit period. The laboratory has only been used for special tests. The uncertainty calculations are almost ready to go into production, as soon as a loggable temperature probe is delivered. The calculations have been approved by MSL.

Nova only uses components calibrated by a laboratory.

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

I checked certification reports for 46 metering installations to confirm data storage devices were certified.

Audit commentary

All data storage devices were appropriately certified. Nova has the relevant type test reports in their records, and they have a summary sheet showing the date type test reports were obtained. I recommended during the audit that Nova expand the summary sheet to have a checklist of every requirement in the Code, and that the type test reports are re-checked to confirm every requirement. The reason for this recommendation is that a laboratory may provide a type test report even if some items have failed type testing, so the existence of a type test report does not necessarily confirm compliance. Nova adopted this recommendation and provided a copy of the new schedule prior to the finalisation of the audit report.

Audit outcome

Compliant

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 Nova's component stickers to confirm compliance.

Audit commentary

I checked the photos for 46 Category 1 and Category 2 metering installations and in all cases, the certification stickers contained the appropriate detail and were correctly applied.

Audit outcome

Compliant

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

Code related audit information

A metering component certification sticker must show:

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

Audit observation

I checked Nova's component stickers to confirm compliance.

Audit commentary

I checked the photos for 46 Category 1 and Category 2 metering installations and in all cases, the certification stickers contained the appropriate detail and were correctly applied.

Audit outcome

Compliant

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

Code related audit information

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

The sealing system will identify:

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

Audit observation

I checked the quality documentation and a sample of 46 certification records to confirm compliance.

Audit commentary

Installations are sealed using the wire and ferrule method with numbered sealing tools. During the audit it was confirmed that for three sealing tools issued to a field technicians the appropriate records were held in the sealing tool register. The sealing of main switches is a requirement in the SOP and paper seals are provided for this purpose in case the wire and ferrule method cannot be used.

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 46 certification records to confirm compliance.

Audit commentary

I did not identify any examples of incorrect certification. I specifically checked the management of burden and uncertainty for Category 2 comparative certification. These practices are compliant.

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 46 metering installations to confirm compliance.

Audit commentary

All 46 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 46 metering installations.

Audit commentary

I checked the design reports and confirm they are all compliant. Design reports were recorded correctly in all certification records checked.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

I checked the current suite of design reports and the certification records for 46 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

Nova has not certified any installations as a lower category.

Audit commentary

Nova 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

Nova has not certified any installations as a lower category.

Audit commentary

Nova 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

Nova has not certified any installations as a lower category.

Audit commentary

Nova 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

Nova has not certified any installations as a lower category.

Audit commentary

Nova 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 46 metering installations to confirm compliance.

Audit commentary

The certification records confirm that Nova has used the Selected component and Comparative recertification methods for certification of category 1, 2 and 3 metering installations. The methods used have been used appropriately.

The method of certification can be determined from the certification reports, but I recommended during the audit that the reports contain a field confirming whether certification is selected component or comparative. Nova adopted this recommendation and provided an updated certification report prior to the finalisation of the audit report.

Audit outcome

Compliant

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

Nova conducted comparative recertification for category 2 metering installations during the audit period. I checked the certification records and confirm compliance.

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

Audit commentary

Nova conducted comparative recertification for category 2 metering installations during the audit period. I checked the certification records and confirm compliance.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the certification reports for two Category 3 metering installations.

Audit commentary

The certification reports for two Category 3 metering installations confirmed that HHR metering was present.

Audit outcome

Compliant

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 46 certification reports to confirm compliance.

Audit commentary

Nova’s documented procedures 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. Nova 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 meter sheet forms part of the design report and contains details of meter programming.
- 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. The SOP for commissioning tests requires the application of a load, then an increase to the load to ensure the pulse rate increases. The register advance test is conducted at the same time and nearly all meters have appropriate decimal places to ensure this test can be conducted in a reasonable timeframe. If a meter does not have decimals the test is required to be performed until one kWh has been consumed and the register advances by this amount.
- 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.

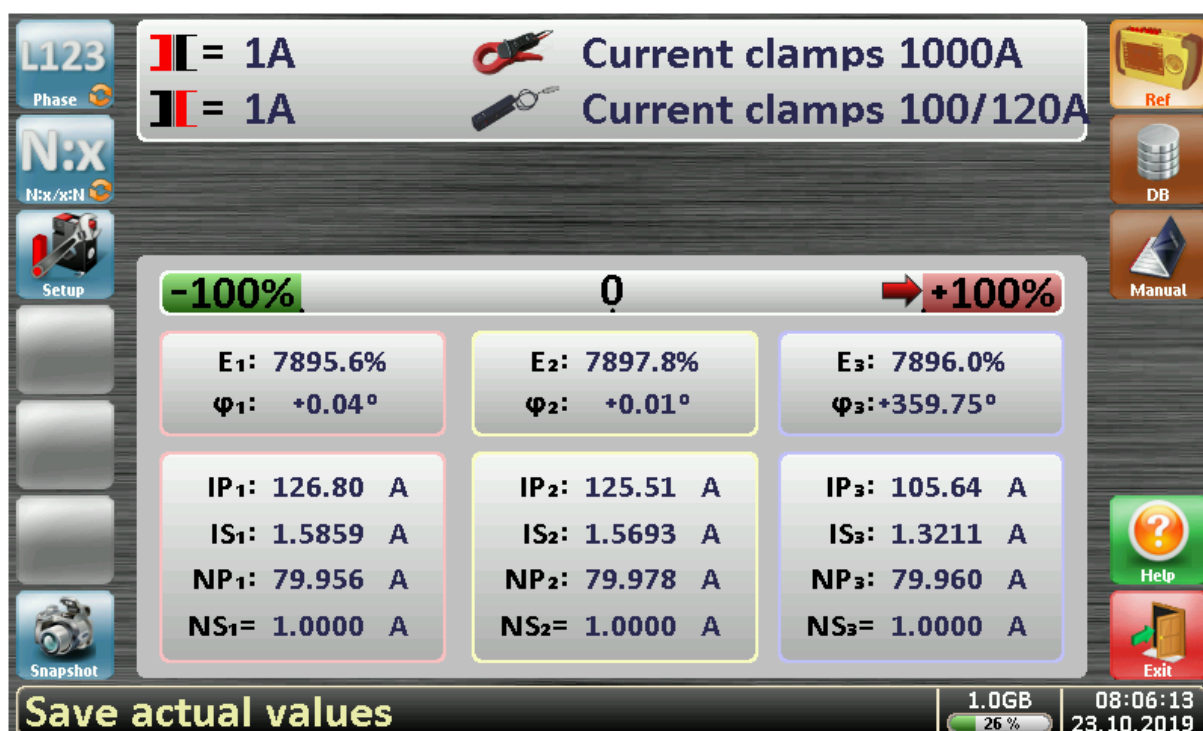
Nova has confirmed that the back office (Nova back office) conducts a sum-check.

For category 2 HHR installations Nova 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. This process is used and is compliant.
- 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. Nova has conducted raw meter data output tests in accordance with this clause using a working standard.

Nova requires a set of photos showing every test result to ensure the test was conducted and that the test passed. Some examples are shown below:

Ratio test



Load check



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 46 certification reports to confirm compliance.

Audit commentary

For category 2 or 3 HHR installations Nova obtains the data from the back-office system and compares this with the output from the working standard.

For AMI installations, Nova relies on the comms check and sum-check validation processes in the back office.

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 46 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 46 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 46 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 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 46 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 46 metering installations to confirm compliance.

Audit commentary

I confirmed that the current transformers expire before the meter in these installations. 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 46 metering installations 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. Nova conducts five comparative tests per installation to ensure the measurement uncertainty is as low as possible.

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

Nova does not conduct certification under this clause.

Audit commentary

Nova 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

Nova does not conduct certification under this clause.

Audit commentary

Nova 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

Nova does not conduct certification under this clause.

Audit commentary

Nova 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

Nova does not conduct certification under this clause.

Audit commentary

Nova 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

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

Audit commentary

Nova has not conducted insufficient load certification during the audit period. The Nova 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

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

Audit commentary

Nova 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

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

Audit commentary

Nova 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 46 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 46 metering installation certification records to confirm compliance.

Audit commentary

The SOP stipulates the maximum permitted errors for certification. I checked several certification records to confirm 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 46 metering installation and discussed the process for error calculation.

Audit commentary

Nova'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 46 metering installation certification records, and process documentation.

Audit commentary

Nova has documented instructions for determining compensation factors. The multiplier and ratio are both populated on the commissioning form. Nova does not deal with error or loss compensation.

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 10 metering installation certification records, and process documentation.

Audit commentary

Nova has documented instructions for determining compensation factors. The multiplier and ratio are both populated on the commissioning form.

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. Nova complies with these requirements. BTS meters are all re-calibrated when removed from a site, prior to reinstallation.

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 46 certification records to confirm compliance.

Audit commentary

All meter and metering installation certification expiry dates were correct. The metering installation certification expiry date is recorded clearly, as shown below:

ICP Expiry Date **29/10/2029**

The metering installation certification date is recorded as follows:

Date: 29/10/2019

I recommended during the audit that the certification date is moved to the beginning of the report and is re-named to clarify that it is the certification date. Nova adopted this recommendation and provided an updated certification report as shown below.

ICP Certification
Date

ICP Expiry Date

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

Nova does not install any electromechanical meters.

Audit commentary

Nova 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

I checked the records for 46 metering installations to confirm compliance.

Audit commentary

Nova only installs new or re-calibrated CTs. The process documentation and certification records confirm compliance.

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 the records for 46 metering installations to confirm compliance.

Audit commentary

The Nova process documentation 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

I checked the records for 46 metering installations to confirm compliance.

Audit commentary

The metering installation certification report contains a field for CT expiry date and a check of 46 records confirmed this was being calculated and used correctly.

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 Nova 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

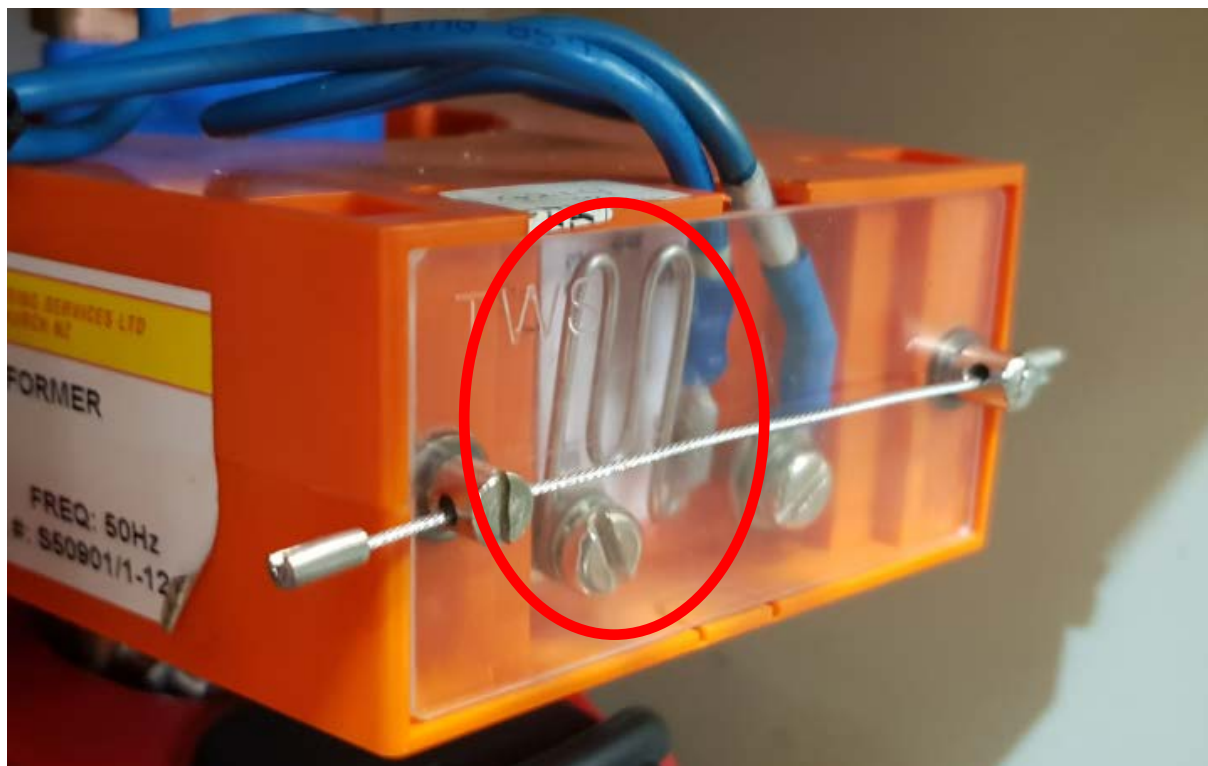
I checked processes and the records for 20 category 2 metering installations to confirm compliance.

Audit commentary

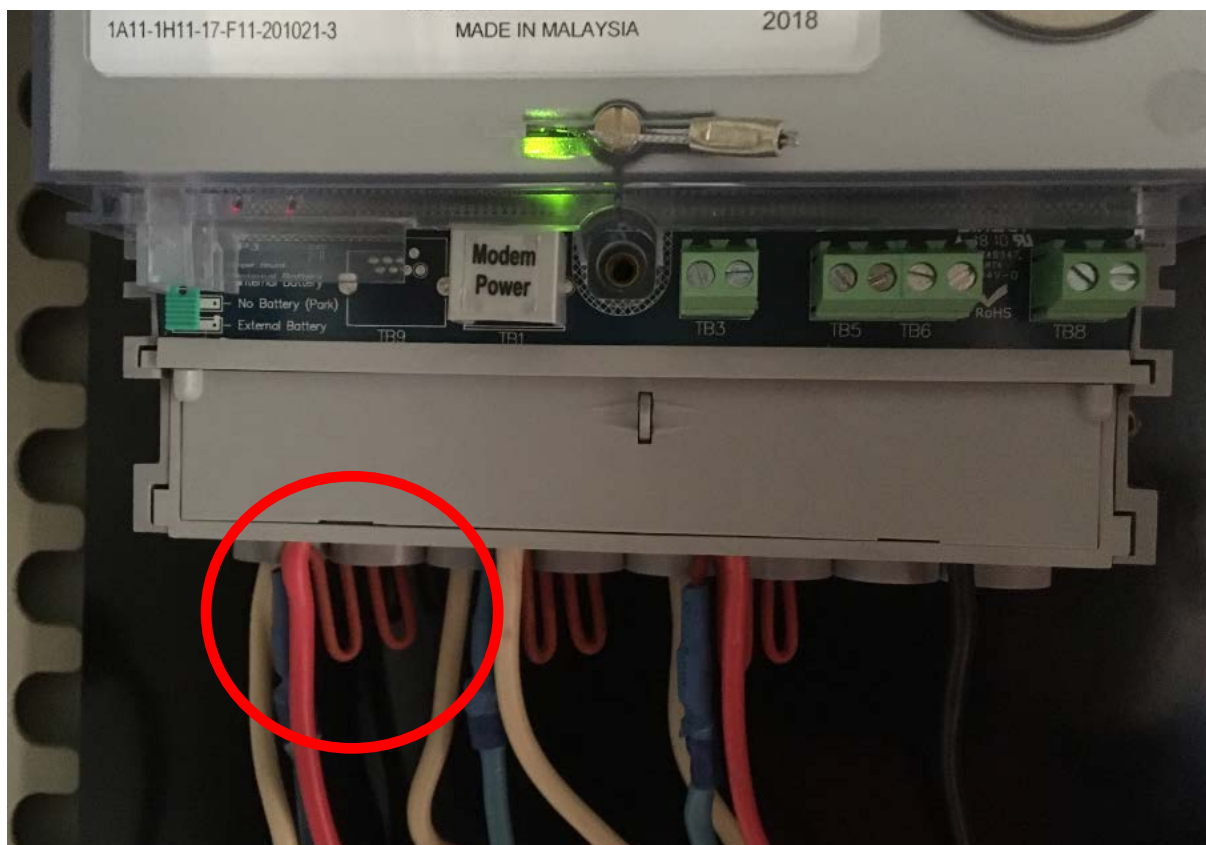
The issue of the low burden for CTs has been clarified by the Authority through a memo, which confirms that ATHs are required to take certain actions if the in-service burden is less than the lowest test point used when the CT was calibrated. The actions are to install burden resistors or confirm with a Class A ATH or the manufacturer that the CTs will continue to operate accurately at low burden. Most new CTs are manufactured and certified by TWS Energy Controls Ltd (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.

All CTs are purchased as calibrated components by TWS. Some CTs have compensated windings and some have non-compensated windings. Those with compensated windings may have errors if the burden is less than 25% of the rated burden. TWS is unaware of the in-service burden when the CTs are certified. Nova installs burdening resistors in all cases to ensure the in-service burden is at least 25% of the rated burden. The burden resistors are installed at the meter or at the CTs depending on whether access can be gained to the CTs. All non-TWS CTs are removed during re-certification. The photos below show the two methods for burden resistor installation.

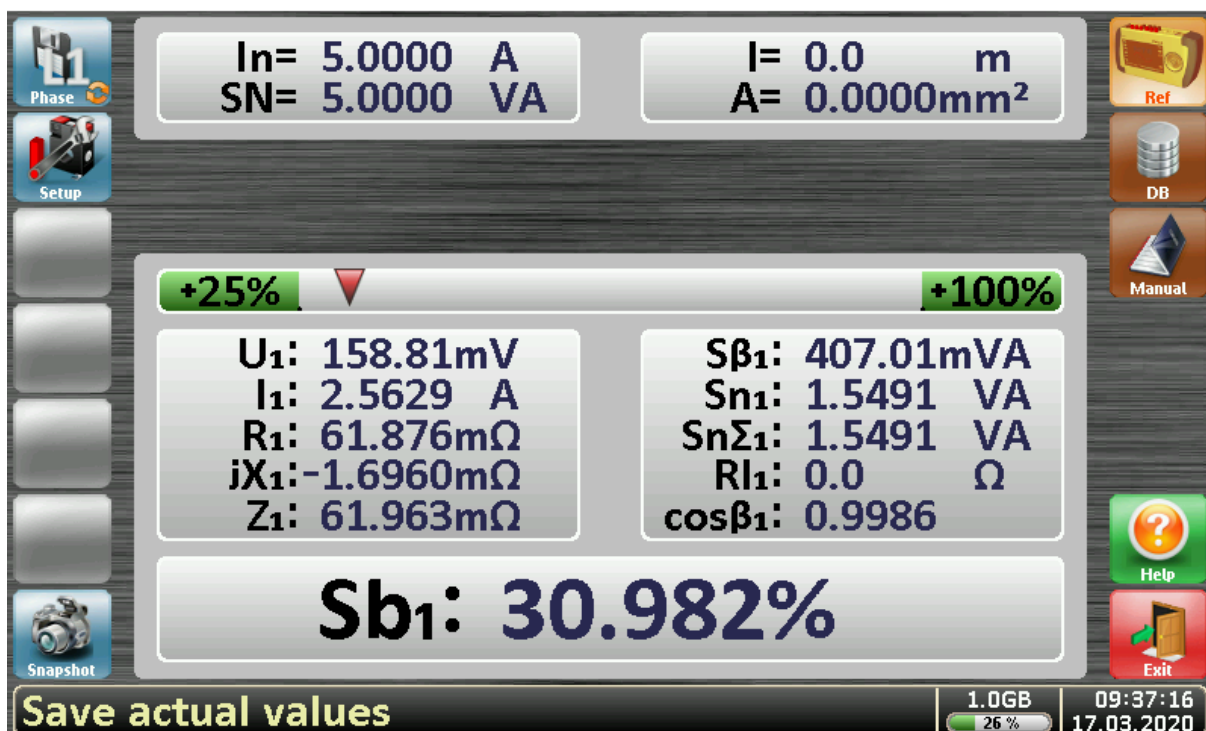
Burden resistor at the CT



Burden resistors at the meter



Nova also ensures there is a photo of every test, which provides confirmation that the test was conducted and the result. The burden test below shows one example.



Audit outcome

Compliant

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

Code related audit information

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

- the measuring transformer has not previously been certified due to failure to obtain access*
- the ATH is satisfied that the metering installation will comply with the applicable accuracy requirements*
- the ATH has advised the MEP that the metering installation has been certified by this method*
- the MEP has advised the registry of the certification.*

Audit observation

Nova has not applied alternative certification.

Audit commentary

Nova 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 process documentation and certification records for 46 metering installations to confirm compliance.

Audit commentary

Nova 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. Most metering installations occur on the Horizon network and they have provided a letter stating that there are no signal propagation issues with the 317Hz plant. Nova consults with other networks as required to ensure compliance with this clause.

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

Most metering installations occur on the Horizon network and they have provided a letter stating that there are no signal propagation issues with the 317Hz plant. Nova consults with other networks as required to ensure compliance with this clause.

Audit commentary

Most metering installations occur on the Horizon network and they have provided a letter stating that there are no signal propagation issues with the 317Hz plant. Nova consults with other networks as required to ensure compliance with this clause.

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 to confirm compliance.

Audit commentary

No data storage devices were reinstalled by Nova. All data storage devices that are installed by Nova are integral to meters. All meters installed by Nova 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

The points above, apart from point “d” will be documented in the type test report, which should be checked as part of the certification process for the data storage device. Nova has compliant processes for the certification of components.

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 46 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 Nova 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 46 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 46 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 Nova 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 46 metering installations to confirm compliance.

Audit commentary

Nova has appropriate arrangements for storage and transportation. Nova 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 46 metering installations to confirm compliance.

Audit commentary

The process documentation achieves compliance with all of the requirements above. I checked the records for 46 Category 1, 2 and 3 metering installations, and I confirm that all components and enclosures were appropriately sealed. Main switches are sealed in all cases and if wire is not suitable then destructible paper seals are used.

I checked the sealing tool number for three technicians to ensure they were correctly recorded in the sealing tool register to enable tracking of the person who applied any given seal. The date of application of seals is recorded in the metering installation certification record.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, metering records and photos for 46 metering installations to confirm compliance.

Audit commentary

The process documentation, metering records and the photos for 46 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 46 metering installations to confirm compliance.

Audit commentary

The process documentation achieves compliance with all of the requirements above. I checked the records for 46 Category 1, 2 and 3 metering installations, and I confirm that all components and enclosures were appropriately sealed. Main switches are sealed in all cases and if wire is not suitable then destructible paper seals are used.

I checked the sealing tool number for three technicians to ensure they were correctly recorded in the sealing tool register to enable tracking of the person who applied any given seal. The date of application of seals is recorded in the metering installation certification record.

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

Nova has appropriate instructions in relation to this requirement and there is the ability to record this information on the commissioning record for the installation.

There were three recent examples to examine, which confirm the process operates as intended.

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 22 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 metering installation certification reports for 22 metering installations to confirm compliance.

Audit commentary

The checks demonstrated compliance with this requirement.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and 46 certification records to confirm compliance.

Audit commentary

Nova 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 Nova processes for certification of metering components.

Audit commentary

Nova 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

I checked the process documentation and calibration records to ensure compliance.

Audit commentary

The Nova calibration methodology follows the relevant requirements of ISO17025, this was verified during the audit. Nova is not currently calibrating meters for certification purposes until they have a new temperature logger delivered.

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 Nova.

Audit commentary

Nova uses more than 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 Nova calibration reports met the above requirements.

Audit commentary

The Nova calibration methodology follows the relevant requirements of ISO17025, this was verified during the audit. Nova is not currently calibrating meters for certification purposes until they have a new temperature logger delivered. Their measurement uncertainty calculations will then be fully compliant.

Audit outcome

Compliant

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.

Audit commentary

I confirmed that the following ISO 17025 requirements were met:

- the laboratory environment is appropriate, and temperature is maintained at 23 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, and
- the calibration reports contain relevant information and are stored and controlled appropriately.

Nova is not currently calibrating meters for certification purposes until they have a new temperature logger delivered. Their measurement uncertainty calculations will then be fully compliant.

Audit outcome

Compliant

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 46 metering installations and the type test reports to confirm compliance.

Audit commentary

All meters are certified, Nova has obtained type test reports for all meters used.

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

Nova does not relocate meters without the meter being recalibrated, even if the time period is less than 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

I checked the certification records for 12 selected component metering installations to confirm compliance.

Audit commentary

Nova obtains calibrated CTs from the manufacturer and certifies them at the time of installation based on the calibration report from the TWS Class A ATH.

Audit outcome

Compliant

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

I checked the certification records for 12 selected component metering installations to confirm compliance.

Audit commentary

Nova obtains calibrated CTs from the manufacturer and certifies them at the time of installation based on the calibration report from the TWS Class A ATH.

Audit outcome

Compliant

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

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

I checked the certification records for 12 selected component metering installations to confirm compliance.

Audit commentary

Nova obtains calibrated CTs from the manufacturer and certifies them at the time of installation based on the calibration report from the TWS Class A ATH. All non-TWS CTs are replaced at the time of certification.

Audit outcome

Compliant

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 20 metering installations to confirm compliance.

Audit commentary

Nova 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 46 metering installations to confirm compliance.

Audit commentary

No separate data storage devices were reinstalled by Nova. All data storage devices which are installed by Nova are integral to meters. All meters installed by Nova 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

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

Audit commentary

Nova 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

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

Audit commentary

Nova 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

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

Audit commentary

Nova 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 46 metering installations 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 reports.

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 46 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 processes and an inspection report 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

I checked processes and 10 inspection reports to confirm compliance.

Audit commentary

Nova's inspection process achieves compliance with this clause.

Audit outcome

Compliant

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 processes and 10 inspection reports to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

6.4 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

The difference between the inspection data and the saved date for the inspection report was within 10 business days for all 10 inspections.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

I checked processes and an inspection report to confirm compliance.

Audit commentary

Nova's inspection process achieves compliance with this clause.

Audit outcome

Compliant

7. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

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

Code related audit information

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

Audit observation

I checked Nova's process documentation, reporting forms and five examples.

Audit commentary

Nova has a process which is compliant with the Code. The content of reporting includes all relevant detail. Nova was the ATH and MEP for all five examples, therefore the notification requirements were met.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked Nova's process documentation, reporting forms and five examples.

Audit commentary

Nova has a process which is compliant with the Code. The content of reporting includes all relevant detail. Nova was the ATH and MEP for all five examples, therefore the notification requirements were met.

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 Nova's process documentation, reporting forms and five examples.

Audit commentary

Nova has a process which is compliant with the Code. The content of reporting includes all relevant detail. Nova was the ATH and MEP for all five examples, therefore the notification requirements were met.

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 Nova's process documentation, reporting forms and five examples.

Audit commentary

Nova has a process which is compliant with the Code. The content of reporting includes all relevant detail. Nova was the ATH and MEP for all five examples, therefore the notification requirements were met.

Audit outcome

Compliant

8. CONCLUSIONS

Nova conducted a comprehensive review of the ATH operation after the previous audit and as a result several updates to processes and documentation were made. Nova had a target of achieving 100% compliance during this audit and the target was met. The audit found compliance with all relevant clauses of the code. A small number of recommendations for improvement were made during the audit, which were all adopted prior to the finalisation of this report.

Category 2 certification compliance has proved problematic for the industry in general, however Nova demonstrated robust practices for the measurement of uncertainties and the management of in-service burden.

The management and control of field contractors has improved, with additional emphasis on the review of on-site photos and certification records.

The Class B laboratory has not been used for calibration purposes while Nova has been reviewing and improving the management of uncertainties, in liaison with MSL. The laboratory is close to being fully operational again.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The future risk rating table provides some guidance on this matter and recommends a next audit frequency of 36 months. I agree with this recommendation.

9. NOVA RESPONSE