VERITEK

Electricity Industry Participation Code Audit Report

For

Delta Utility Services Ltd
Class A and B
Approved Test House

Prepared by Brett Piskulic – Veritek Limited

Date of Audit: 22/06/2020

Date Audit Report Complete: 13/08/2020

Date Audit Report due: 26/08/2020

Executive Summary

Delta is a Class A and B Approved Test House and is required to undergo an audit by 26/08/20, in accordance with clause 16A.19(b).

Since the previous audit Delta has improved the clarity of its certification reports, added a process for applying burden to current transformers and reviewed the processes for calculation of error and uncertainty.

Ten non-compliances have been recorded.
Five of the non-compliances relate to incorrect or missing information being recorded on metering installation certification reports and the late provision of certification reports to MEPs.

Non-compliance has been recorded in relation to the selection of samples for the statistical recertification. I have also raised the issue of recertification by statistical sampling of installations which include data storage devices as the Code is not clear in this area.

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

The matters found are shown in the tables below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Metering Installation Type	3.2	8(2) of Schedule 10.7	1 of 63 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH.	Strong	Low	1	Identified
Provision of certification records	3.9	14 Of Schedule 10.4	Certification records provided to the MEP late for four of ten metering installations.	Moderate	Low	2	Identified
Meter Requirements	3.11	26 (4) of Schedule 10.7	One metering installation certification report did not contain the maximum interrogation cycle. 18 metering installation certification reports with maximum interrogation cycle incorrectly recorded.	Moderate	Low	2	Identified
Determine Maximum Interrogation Cycle	3.14	36 (3) of Schedule 10.7	One metering installation certification report did not contain the maximum interrogation cycle. 18 metering installation certification reports with maximum interrogation cycle incorrectly recorded.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Metering Component Stickers	4.14	8(2) of Schedule 10.8	Metering component sticker does not include the name of the calibration laboratory.	Moderate	Low	2	Identified
ATH Must Not Certify Metering Installations under Certain Circumstances	5.1	8(2) of Schedule 10.8	1 Cat 3 installation certified with uncertainty greater than 0.3%. 1 Cat 2 installation certified with class 3 CTs.	Moderate	Low	2	Identified
Requirement for Metering Installation Design Report	5.3	2 (4) Of Schedule 10.7	Design report reference not recorded in metering installation certification report in 2 cases out of 63 checked.	Strong	Low	1	Identified
Statistical Sampling	5.26	16 of Schedule 10.7	Incorrect statistical sampling certification applied.	Weak	Medium	6	Disputed
Error calculation	5.30	22 Of Schedule 10.7	Uncertainty higher than 0.3% for 1 Cat 4 installation.	Moderate	Low	2	Cleared
Installations Incorporating Control Devices	5.42	33(2) of Schedule 10.7	13 control devices certified with incorrect expiry dates.	Weak	Low	3	Identified
					Future Risk Rating	**23**	
					Indicative Audit Frequency	**6 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	

Table of Issues

Issue	Description
Regarding: Clause 38(1) and (2) of Schedule 10.7 and clause 5(1) of Schedule 10.8	Certification of data storage devices when statistical recertification is conducted The code requires data storage devices to meet the requirements of clause 38(1) and (2) of Schedule 10.7 and clause 5(1) of Schedule 10.8. It is unclear how this should be applied when conducting recertification by statistical recertification under clause 16 of Schedule 10.7.

Persons Involved in This Audit

Auditor:

Brett Piskulic
Veritek Limited
Electricity Authority Approved Auditor

Delta personnel assisting in this audit were:

Name	Title
Godfrey Dube	Metering Services Manager
Harrison Orme	Compliance and Technical Support
Stephen Cook	Metrology Test Technician
Allan Woods	Laboratory Quality Manager

Contents

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

Delta is a Class A and 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 26 August 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.

Delta wishes its ATH approval to include the following functions of Clauses 3(2) 4(2) of Schedule 10.3:

Class A Approval:

(a) calibration of—
- (i) working standards:
- (ii) metering components (other than a calibration referred to in paragraph (c)):
- (iii) metering installations:

(b) issuing calibration reports:
(c) calibration of metering components on site:
(d) installation and modification of metering installations:
(e) installation and modification of metering components:
(f) certification of all categories of metering installations under this Code, and issuing of certification reports:
(g) testing of metering installations under clause 10.44 and production of statements of situation under clause 10.46:
(h) inspection of metering installations.

Delta also requires approval to certify metering components. I note that the Class A functions listed in Clause 3(2) of Schedule 10.3 do not include certification of metering components.

Class B Approval

(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:
(f) certification, using the fully calibrated 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.

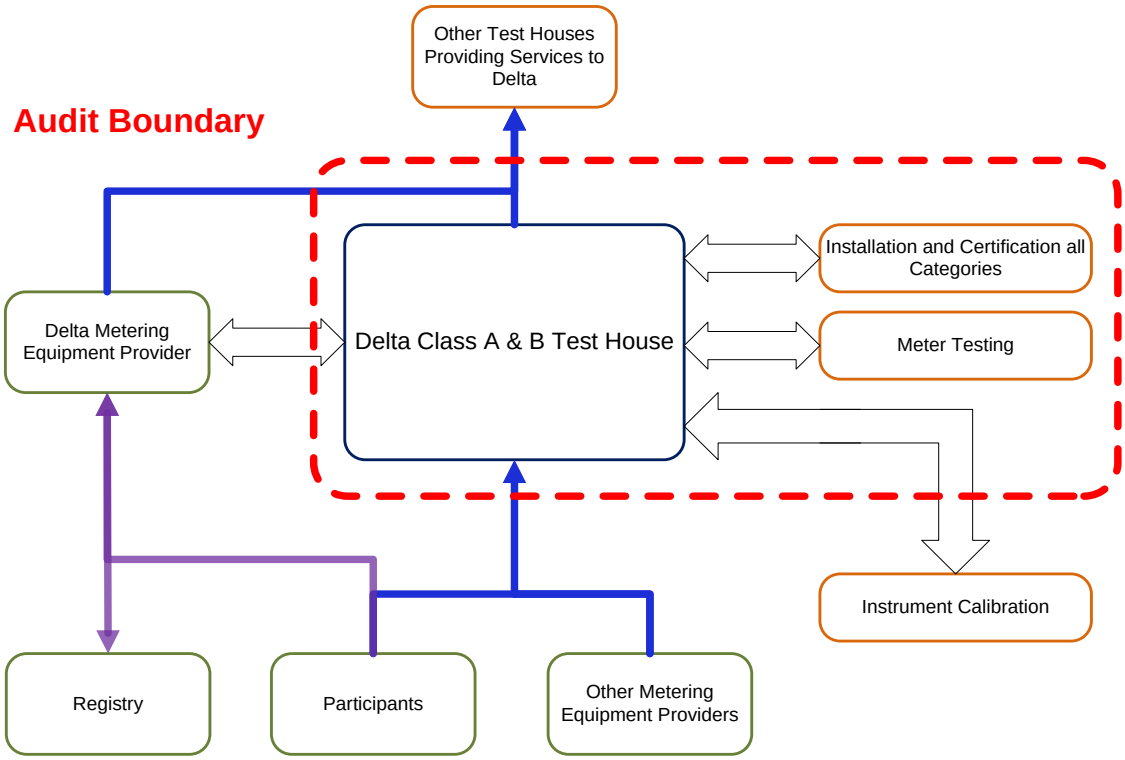
Delta also requires approval to certify metering components. I note that the Class B functions listed in Clause 4(2) of Schedule 10.3 do not include certification of metering components.

Delta has a Class A laboratory, which provides services to a number of MEPs as well as supporting their own MEP function.

Delta provides field ATH services to a number of other MEPs in respect of the installation and/or re-certification of time-of-use (TOU) and high voltage metering. Delta also provides installation of Category 1 and Category 2 metering using their own staff and subcontractors. Delta provides training, and also audits the ongoing compliance and competence of these staff and subcontractors by internal audit.

Most audit requirements of the Class A Test House are covered in their external ISO 17025 Audit, conducted annually by IANZ.

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


Other Test Houses Providing Services to Delta
Audit Boundary
Delta Metering Equipment Provider
Delta Class A & B Test House
Installation and Certification all Categories
Meter Testing
Instrument Calibration
Registry
Participants
Other Metering Equipment Providers

1.3 Previous Audit Results

The last audit was conducted in August 2017 by Steve Woods of Veritek. This audit found two non-compliances and one recommendation was made, the current status of these are shown in the tables below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Use of meter class accuracy	5.24	13(7) Of Schedule 10.7	Meter measured accuracy used instead of meter class accuracy for fully calibrated installations.	Cleared
Error calculation	5.30	22 Of Schedule 10.7	Temperature variations not considered in uncertainty calculations.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Certification & Calibration Reports	3.6	11 of schedule 10.4	Improve clarity of titles and dates in certification reports.	Cleared

Issue	Description
Regarding: Clause 4(1)(a) of schedule 10.7	Use of meter class accuracy when determining errors Keith Jones from the Measurement Standards Laboratory of NZ has advised that it is scientifically impossible to comply with both ISO17025 and with clause 13(7) of schedule 10.7 which requires that meter class accuracy is used. Furthermore, the MSL calculator provided by Keith has been confirmed by the Authority as complying with JCGM 100:2008, but the calculator requires measured accuracy figures not meter class accuracy figures.

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

Audit commentary

Delta has a number of contractors operating under their ATH. Clause 10.3(c) requires that Delta *"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."*

All technicians are subject to an audit regime and Delta demonstrated appropriate reporting for this work. Post installation audits are conducted on a sample of 3% of all jobs completed and all technicians are required to participate in a "live" audit annually.

Audit outcome

Compliant

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

I did not find any examples where Delta had not taken all practicable steps to ensure information was complete and accurate, or not likely to mislead or deceive.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

Delta 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

Delta 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

Delta has only conducted activities that fall within the scope of their approval. I have concluded from this audit that Delta has met the requirements of this clause. I checked compliance with other enactments, specifically the electricity regulations with regard to safety practices and I confirm the following critical points are managed in a robust manner:

- supply polarity testing - MP-032 details polarity testing for meter replacement and it is complete and thorough,
- safety practices with regards to the management of asbestos switchboards - appropriate instructions (SM-P014) are contained in the installer's manual, and
- general safety practices and the appropriate use and testing of personal protective equipment - instructions are in place for staff and contractors.

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 reports to confirm the scopes were appropriate and that certification was in place.

Audit commentary

Delta provided a copy of their most recent ISO 9001:2015 audit report, dated September 2019, which was conducted by Telarc Limited. The scope of the ISO 9001:2015 certification is appropriate for the work undertaken and is recorded as: *"…the installation, disconnection repair and field services for meters."*

The September 2019 report raised the following relevant issue:

Issue	Description	Status
Minor non-conformance	This non-conformance is the retention of NC 3 from your 2018 assessment. It relates to having evidence you are continuing to evaluate, and re-evaluate, the performance of your external providers, i.e. sub-contractors, suppliers, consultants and any other entity that supplies or provides a service. As indicated, the process setting out how, and when, Form CM-F003 is used could be enhanced by the application of some risk-based thinking to minimise the administrative effort of undertaking the evaluations. One option might be to incorporate a mini-risk matrix that could be used to determine the respective risk profile of each provider. Thought could be given to the possibility of recognising those providers who present either no, or very low risks to Delta, being excluded from your re-evaluation process.	In-progress

Delta also provided a copy of their most recent ISO 17025:2017 audit report, dated March 2020, which was conducted by IANZ.

The scope of their ISO 17025 certification is appropriate and is notes as:

Field of operations: *Metrology and Calibration Laboratory*
Subfields : *Electrical/Energy Meters/PPE*

The audit report contained one corrective action request and two recommendations.

The matters raised are shown in the table below.

Issue	Description	Status
Corrective Action	The laboratory's quality manual was a copy of the new ISO/IEC 17025:2017 standard and did not reflect how the laboratory met the requirements of the standard. The laboratory is requested to update/include procedures to cover (relevant clauses of ISO 17025 in brackets): · Identifying risks to impartiality on an ongoing basis [4.1.4] · Including the following requirements in reports, unless there is a valid reason for not doing so: o Unique identification of pages that they are a portion of a whole report [7.8.2.1 d)] o Date of issue of the report [7.8.2.1 j)] o Laboratory temperature units reported incorrectly as "Deg" or "°" rather than "Deg C" or "°C" [7.8.2.1 m)] o No criteria/decision rule stated for the pass/fail status reported [7.8.6.2] · Covering the following input items in management review meetings: o The outcome of the internal audits [8.9.2 e)] o Results of risk identification [8.9.2 m)] The following was unable to be reviewed at the time of the assessment and will need to be provided: · The documented complaints procedure [7.9]	In-progress
Recommendation	The quality manual was a direct copy of the requirements of ISO/IEC 17025:2017 but did not reflect how the laboratory met the standard. Cross references to the relevant procedures could be added to the sections of the quality manual to indicate how the ISO 17025 requirements are met. [8.2.4]	In-progress
Recommendation	It is strongly recommended that the processes and procedures for assigning KTPs are finalised. [IANZ Specific Criteria 5, Appendix 3]	Cleared

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

Godfrey Dube is recorded as the Quality Manager and Harrison Orme is recorded as the Technical Manager. Godfrey and Harrison have appropriate qualifications and the roles and responsibilities are documented in Section 7 of the quality manual.

An ATH must ensure that all staff who perform or supervise work or activities regulated under this Part are technically competent, experienced, qualified, and trained for the functions they perform. I checked the training and competency assessment processes and looked at the training records for a new contractor. The records included field records of jobs completed under supervision whilst undergoing training prior to final approval. I confirm compliance with this clause.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

The quality management system meets the requirements of the Code.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Delta has not conducted any material changes.

Audit commentary

Delta has not conducted any material changes.

Audit outcome

Compliant

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

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

Audit commentary

Delta 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 records in the quality manual to confirm compliance.

Audit commentary

Access to the laboratory and storage area is restricted and controlled via swipe access cards. Roles are defined in the quality manual, and this includes whether they can access laboratory or not.

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.

Audit commentary

The documentation achieves compliance with the Code.

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 Delta's component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause.

Audit outcome

Compliant

2.15 Interference with Metering Installations (Clause 10.12)

Code related audit information

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

Audit observation

I audited this clause by exception.

Audit commentary

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

Audit outcome

Compliant

3. METERING RECORDS AND REPORTS

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

Code related audit information

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 63 certification reports to confirm compliance.

Audit commentary

All reports have a field for NHH/HHR and the location of the services access interface. These fields were populated correctly with the exception of the installation type (HHR/NHH) for the certification at ICP 0004695445AL621 completed on 12/11/2019.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 8(2) of Schedule 10.7 From: 12-Nov-19 To: 22-Jun-20	1 of 63 Metering installation certification reports checked did not indicate whether the installation is HHR or NHH. Potential impact: Low Actual impact: Low Audit history: once Controls: Strong Breach risk rating: 1

Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as strong as Delta conducts checking of all certification reports prior to finalisation of the reports. There is very little impact on other participants; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
Data entry correctness reminder to be sent to all technicians.		30-10-20	Identified
Preventative actions taken to ensure no further issues will occur		**Completion date**	
Photo Checking process reviewed, and changes implemented.		Complete	

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 63 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 Delta whether any different test points had been used.

Audit commentary

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

Audit outcome

Compliant

3.5 Services Access Interface (Clause 10 of Schedule 10.4)

Code related audit information

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

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

Audit observation

I checked the design reports and a sample of 63 certification records to confirm compliance.

Audit commentary

The location of the Services Access Interface was recorded in all of the certification reports checked as required by this clause.

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 63 certification records to confirm compliance.

Audit commentary

Certification reports were produced for all 63 installations. The certification and calibration reports contain all the required information.

In the previous audit it was recommended that the certification reports be updated to improve the clarity. This has been addressed with the following improvements:

- reports are clearly identified with “Metering Installation Certification Report” at the top of the page,
- metering installation category is clearly identified,
- certification date is clearly identified, and
- certification expiry date is clearly identified.

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 63 metering installations along with the storage practices.

Audit commentary

All of the records were available and provided. Records are stored indefinitely.

Audit outcome

Compliant

3.8 Retention of Records (Clause 13 of Schedule 10.4)

Code related audit information

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

Audit observation

I checked the certification records for 63 metering installations along with the storage practices.

Audit commentary

All records were available, and the content was correct. Records are stored indefinitely.

Audit outcome

Compliant

3.9 Advise MEP of Records, Certificates or Reports for a Metering Installation (Clause 14 Of Schedule 10.4)

Code related audit information

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

Audit observation

I checked the communication trail for a sample of ten metering records for category 2 and above metering installations.

Audit commentary

Metering installation certification reports were provided to the MEP within five business days for six of the ten metering installations. Metering installation certification reports were not provided within five business days for four metering installations as detailed in the following table.

ICP	Highest Meter cat	Cert Date	Cert Exp date	Certification Number	MEP	Date provided to MEP	Business days
0000050575WTC6E	4	28/11/2019	28/11/2024	2946	AMCI	11/12/2019	9
0000208247DEC59	3	6/12/2018	22/09/2020	2817	AMCI	10/01/2019	21
0000740384NV1A2	2	28/01/2020	28/01/2030	1184826	SMCO	10/02/2020	8
0001031004AL19D	2	22/01/2020	22/01/2030	1176845	SMCO	14/02/2020	16

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.9 With: Clause 14 Of Schedule 10.4 From: 10-Jan-19 To: 22-Jun-20	Certification records provided to the MEP late for four of ten metering installations. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because there is room for improvement. The impact on MEPs is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Aurora act as an agent for Registry updates. To alleviate these issues, this function is to be migrated in-house urgently. - Conduct Gentrack/Registry training for Delta staff. - Commence Registry updates by Delta staff	Complete	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Migrate Gentrack and Registry management and administration from Aurora to Delta. Manual data entry in Gentrack Velocity to be performed and monitored locally.	30-12-30	

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

I checked the certification records for two installations certified under this clause in the audit period.

Audit commentary

In both cases details of protection devices limiting the maximum current of the installations were recorded in the metering installation certification reports.

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 63 certification records.

Audit commentary

Delta as a Class A ATH has not certified any installations where the meter requires maintenance and they have not conducted any maintenance on any components. As a Class B ATH, Delta is unlikely to deal with any meters where maintenance is required. All AMI devices installed have battery monitoring conducted as part of the data collection function.

I checked 63 certification reports to confirm if the maximum interrogation cycle is recorded. One of the 63 certification reports did not have the maximum interrogation recorded (ICP 0000050575WTC6E). The maximum interrogation cycle was incorrectly recorded in 18 of the certification reports.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 3.11 With: Clause 26 (4) of Schedule 10.7 From: 09-Apr-18 To: 22-Jun-20	One metering installation certification report did not contain the maximum interrogation cycle. 18 metering installation certification reports with maximum interrogation cycle incorrectly recorded. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	**Completion date**	**Remedial action status**
Delta will check with each MEP we install meters for to ensure we have the correct maximum interrogation periods for all meters we install. Paperwork will be amended where required.	30-11-20	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Delta will check with each MEP we install meters for to ensure we have the correct maximum interrogation periods for all meters we install. Paperwork will be amended where required.	30-11-20	

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 63 certification records to confirm compliance.

Audit commentary

Certification expiry dates were correctly calculated and recorded in the reports checked.

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

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

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 processes and the records for 63 metering installations to confirm compliance.

Audit commentary

I checked 63 certification reports to confirm if the maximum interrogation cycle is recorded. One of the 63 certification reports did not have the maximum interrogation recorded (ICP 0000050575WTC6E). The maximum interrogation cycle was incorrectly recorded in 18 of the certification reports.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.14 With: Clause 36 (3) of Schedule 10.7 From: 09-Apr-18 To: 22-Jun-20	One metering installation certification report did not contain the maximum interrogation cycle. 18 metering installation certification reports with maximum interrogation cycle incorrectly recorded. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**

Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Delta will check with each MEP we install meters for to ensure we have the correct maximum interrogation periods for all meters we install. Paperwork will be amended where required.	30-11-20	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Delta will check with each MEP we install meters for to ensure we have the correct maximum interrogation periods for all meters we install. Paperwork will be amended where required.	30-11-20	

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 IANZ report which confirmed the test laboratory environment was appropriate.

Audit commentary

I checked the IANZ report which confirmed the test laboratory environment was appropriate.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

Delta 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 records in the instrument register to confirm compliance.

Audit commentary

Delta has a test instrument register containing records of any repairs and maintenance and includes the status of all items of equipment. This was checked during the audit and is up to date. There have been no repairs during the audit period.

A class B ATH must have and maintain procedures for the purchase of test equipment and associated consumables. The only items considered as "consumables" are stickers, seals and sealing tools. The purchasing and control of these items is in accordance with the relevant processes in Delta's quality system.

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 all of Delta's reference and working standards to confirm they had current calibration certificates.

Audit commentary

I checked the test instrument register and confirmed that all of Delta's reference and working standards had current calibration reports, as follows:

- a PWS 3.3 reference standard,
- L&G 1001 with TVE 102-3 working standard,
- L&G 2001 with TVH 2.1 working standard,
- L&G 4001 with TVK4 working standard, and
- two Hioki 3196 (category 2 working standards).

Every two months a class 0.2 meter is used to conduct a comparison against the test benches.

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 all of Delta's reference and working standards to confirm they had current calibration certificates.

Audit commentary

Delta uses the applicable calibration intervals.

Audit outcome

Compliant

4.6 Calibration of Reference Standards (Clause 3(1)(B)(Ii), (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

The main reference standard is calibrated by AusGrid. This standard is used to calibrate the test bench standards. I checked whether there were any situations where non-reference conditions were relevant.

Audit commentary

There were no situations where calibration occurred, or standards were used in non-reference situations.

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

Delta does not use HV working standards.

Audit commentary

Delta does not use HV working standards.

Audit outcome

Not applicable

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

Code related audit information

An ATH may use a complete calibrated metering component testing system (a test bench) as an alternative to a separately calibrated working standard only if the ATH:
- calibrates the test bench as if it was a working standard
- carries out a testing system accuracy test, using approved reference standards before completing the calibration report.

Audit observation

Delta uses test benches in their laboratory, and they are calibrated in accordance with the Code.

Audit commentary

Delta uses test benches in their laboratory, and they are calibrated in accordance with the Code.

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 is 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 Delta's understanding of this requirement through interview. I checked whether this situation had occurred.

Audit commentary

Delta 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

I checked this by reviewing the IANZ audit report.

Audit commentary

The IANZ report confirms compliance.

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 a sample of calibration and certification reports to confirm compliance with this clause.

Audit commentary

All components are calibrated and certified. The Delta Class A ATH conducts calibration of meters, no calibration is conducted by the Class B ATH. Uncertainty of measurement does not exceed one third of the error listed in the standard.

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 the certification records for 18 metering installations to confirm compliance.

Audit commentary

Delta certifies control data storage devices in accordance with these clauses. The certification report is combined with the metering installation certification report and contains the required details. Delta has a directory of type test reports for relevant devices.
I have raised an issue in **section 5.45** relating to the statistical recertification of ARC installations which include data storage devices which do not comply with Part 10.

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 Delta's component stickers to confirm compliance.

Audit commentary

Delta is confirming the certification of metering components by attaching a metering component certification sticker as required by this clause.

Audit outcome

Compliant

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

Code related audit information

A metering component certification sticker must show:

- the name of the metering component owner (if available)

- if the metering component is a meter or a measuring transformer:

a) the name of the ATH or the approved calibration laboratory who calibrated the metering component

b) the name of the ATH who certified the metering component

c) the date on which the metering component was certified

d) the initials or other unique identifier of the person who carried out the certification of the metering component.

Audit observation

I checked Delta's component stickers to confirm compliance.

Audit commentary

Delta uses two types of metering component stickers, one applied by the Class A laboratory and the second applied in the field by the Class A ATH. The stickers that are applied to meters which are calibrated by the Delta Class A laboratory contain all of the information required by this clause. The stickers applied in the field contain all the required fields, except for the name of the approved calibration laboratory who calibrated the metering component. The "calibrated by" field had previously been included in the sticker but was removed when the sticker template was updated in August 2018.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.14 With: Clause 8(2) of Schedule 10.8 From: 28-Aug-18 To: 22-Jun-20	Metering component sticker does not include the name of the calibration laboratory. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Stickers have been amended to contain the calibration lab. These new stickers have been ordered and will be distributed to all installers.	30-11-20	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Stickers have been amended to contain the calibration lab. These new stickers have been ordered and will be distributed to all installers.	30-11-20	

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 63 certification records to confirm compliance.

Audit commentary

Delta's sealing policy and procedures are clearly documented in the quality manual (MP-005). Individually numbered seals are used for all metering installations, the seal numbers and location are recorded by the technician at the time of installation.

When a seal is discovered to be broken or missing there is a procedure which ensures that the responsible party is notified.

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 63 certification records to confirm compliance.

Audit commentary

I found the following examples of metering installations certified that did not comply with Part 10.

Site uncertainty

A Category 3 installation at ICP 0000007035DE23E was certified with a maximum site uncertainty of 0.535% which is above maximum allowable uncertainty of 0.3% as detailed in Table 1 of Schedule 10.7.

Overall Installation Test Results (using meter pulse O/P)	Site Temperature (6.6 C to 34.4C for 3196)	11.3	Measured Error (Meter Output vs. Wkg Std)	-0.066%
	Measured Humidity (80% rh **Max** for 3196)	76%	Instrument Uncertainty at stated site conditions	0.535%
	Allowable Installation Error +/- (%)	1.25%	Calculated Total Installation Error (%)	0.600%
	(Cat 2 = 2.5%, Cat 3 & 4 = 1.25%, Cat 5 =0.75%)		**Overall Installation (Pass / Fail)**	**PASS**

Current transformer class

A Category 2 installation at ICP 0000003298DE9FD was certified with class 3 current transformers installed. The minimum class of current transformers allowable in a category 2 installation is class 1, as detailed in Table 1 of Schedule 10.7.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.1 With: Clause 8(2) of Schedule 10.8 From: 30-Jul-19 To: 22-Jun-20	1 Cat 3 installation certified with uncertainty greater than 0.3%. 1 Cat 2 installation certified with class 3 CTs. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because there is room for improvement. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Class 3 CTs on this site are to be changed and the site recertified. The identified cat 3 site will be visited and recertified using the fully calibrated certification method.	30-11-20	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
CTs with multiple class ratings will no longer be certified. Cat 3 sites will now be certified using the fully calibrated method.	Complete	

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 63 metering installations to confirm compliance.

Audit commentary

All 63 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 63 metering installations.

Audit commentary

All of the required information is included in the design reports with the exception of the meter configuration scheme. The configuration scheme is included separately in the MEP specific instruction documents issued to technicians and is recorded in the metering installation certification reports. I have accepted this approach because some design report requirements are in the certification records, and some certification information is on the design report, but at the end of the job all records are considered as one.

I have recorded non-compliance as two of the 63 certification records checked did not include a design report reference.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.3 With: Clause 2 (4) Of Schedule 10.7 From: 06-Dec-18 To: 22-Jun-20	Design report reference not recorded in metering installation certification report in 2 cases out of 63 checked. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong as Delta conducts checking of all certification reports prior to finalisation of the reports. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Data entry correctness reminder to be sent to all technicians.	30-10-20	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Photo Checking process reviewed, and changes implemented.	Complete	

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 63 metering installations.

Audit commentary

All of the required information is included in the design reports with the exception of the meter configuration scheme. The configuration scheme is included separately in the MEP specific instruction documents issued to technicians and is recorded in the metering installation certification reports. I have accepted this approach because some design report requirements are in the certification records, and some certification information is on the design report, but at the end of the job all records are considered as one.

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

I checked whether any metering installations had been certified as a lower category during the audit period.

Audit commentary

I checked two examples of metering installations that were nominally classed as category 3 and were certified as category 2. The certification reports for both installations included details of fuses with a rating lower than the category 2 limit of 500 amps.

Audit outcome

Compliant

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

I checked whether any metering installations had been certified as a lower category during the audit period.

Audit commentary

I checked two examples of metering installations that were nominally classed as category 3 and were certified as category 2. The certification reports for both installations included details of fuses with a rating lower than the category 2 limit of 500 amps.

Audit outcome

Compliant

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

I checked whether any metering installations had been certified as a lower category during the audit period.

Audit commentary

I checked two examples of metering installations that were nominally classed as category 3 and were certified as category 2. The certification reports for both installations included details of fuses with a rating lower than the category 2 limit of 500 amps.
There were no examples identified where there was a requirement for the MEP to monitor load.

Audit outcome

Compliant

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

I checked whether any metering installations had been certified as a lower category during the audit period.

Audit commentary

I checked two examples of metering installations that were nominally classed as category 3 and were certified as category 2. The certification reports for both installations included details of fuses with a rating lower than the category 2 limit of 500 amps.
Site visits were conducted by the ATH to confirm the suitability of the installations.

Audit outcome

Compliant

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

Delta correctly applied and recorded the certification methods.

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

I checked certification records for 17 metering installations certified using comparative recertification and the records for statistical recertification projects to confirm compliance.

Audit commentary

Delta correctly applied and recorded the comparative recertification method for the 17 records checked. I have recorded non-compliance in **section 5.26** regarding the selection of samples when conducting statistical recertification.

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 certification records for six Category 3 and five Category 4 metering installations to confirm compliance.

Audit commentary

All 11 installations had HHR meters.

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 63 certification reports to confirm compliance.

Audit commentary

Prevailing load tests must be conducted on a metering installation or metering component by using a working standard connected to the metering installation. Delta has conducted prevailing load tests in accordance with this clause using a working standard for installations at and above Category 2.

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. As detailed in **section 5.4**, The configuration scheme is included separately in the MEP specific instruction documents issued to technicians and is recorded in the metering installation certification reports. I have accepted that this meets the requirement to complete a component configuration test.

Raw meter data output tests for a category 1 metering installations or category 2 NHH metering installations, must be conducted by applying a measured increase in load and measuring the increment of the sum of the meter registers, or the accumulation of pulses resulting from the increase in load. This test is conducted by using the pulse counting method using an increase in load from zero to a known load.

Raw meter data output tests for a HHR metering installation which are category 1 or category 2 may be conducted by 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. Delta has received confirmation of this from AMS, SmartCo, FCLM, ARC and Intellihub.

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 test is conducted for all HHR metering installations.

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. This test is conducted for all NHH Category 2 metering installations.

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 process documentation and 18 certification reports to confirm compliance.

Audit commentary

HHR certification occurs with an "output to host" test as required by this clause. Delta has received confirmation from relevant MEPs confirming that they have a back-office validation process.

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

I checked process documentation to confirm whether Delta conducts this test.

Audit commentary

Delta uses pulse outputs for testing, not meter registers.

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 2 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 63 metering installations to confirm compliance.

Audit commentary

Delta's records confirmed compliance.

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 63 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 41 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

5.18 Selected Component - Circumstances where method may be used (Clause 11(3) Of Schedule 10.7)

Code related audit information

An ATH must only use the selected component certification method to certify the metering installation if:
- the required tests in Table 3 of Schedule 10.1 are carried out
- each data storage device, meter, and measuring transformer has been calibrated and certified
- each data storage device is certified in accordance with clause 5 of Schedule 10.8
- the ATH provides a certification report for the metering installation.

Audit observation

I checked process documentation, and records for 41 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 17 metering installations to confirm compliance.

Audit commentary

The process documentation is clear, and all comparative certification reports contained confirmation that the meter was replaced by another certified meter.

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 17 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

5.21 Fully Calibrated – Circumstances where method may be used (Clause 13(3) of Schedule 10.7)

Code related audit information

An ATH must use the fully calibrated certification method to certify the metering installation:
- by carrying out the tests set out in Table 4 of Schedule 10.1
- if each of the components (the data storage device, meter, and measuring transformer) has been calibrated and certified.

Audit observation

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

Audit commentary

The certification reports confirmed that appropriate testing was conducted, and that all components were certified.

Audit outcome

Compliant

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

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

Audit commentary

The certification reports confirmed that appropriate testing was conducted, and that all components were certified and that certification reports were prepared.

Audit outcome

Compliant

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

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

Audit commentary

The certification reports confirmed that appropriate testing was conducted, and that all components were certified and that certification reports were prepared. The certification reports recorded all of the points listed above.

Audit outcome

Compliant

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

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

Audit commentary

The certification reports and process documentation confirmed that meter class accuracy is used to calculate the overall error. In the previous audit it was recorded that Delta had used measured accuracy not class accuracy. Delta demonstrated that their error calculation process has been updated and class accuracy is now used.

Audit outcome

Compliant

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 increments 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

I checked process documentation, and records for nine metering installation to confirm compliance.

Audit commentary

The metering installation certification reports clearly indicated that the certification was done under clause 14 of Schedule 10.7 by including the following statement, “This site was certified under the 'Insufficient Load certification' as per Schedule 10.7 Clause 14”. Confirmation that additional integrity checks had been conducted is recorded in the metering installation certification reports in the form of a check box confirming that “MR-002 checks are all OK”. I checked the MR-002 process documents and confirmed that wiring integrity checks are included.
Delta returned to one of the installations and completed testing after receiving notification from the MEP that sufficient load was available. I checked the updated certification report which confirmed testing had been completed and the certification expiry date remained unchanged.

Audit outcome

Compliant

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

I checked the process and test results for the statistical sampling conducted by Delta during the audit period.

Audit commentary

Delta has conducted statistical sampling for Legacy Metering Group (LMG), Arc Innovations (ARC) and Advanced Metering Services (AMS).

As recorded in the February 2019 LMG MEP audit report, the process used in project 1 was non-compliant due to the inclusion of three phase meters and single phase meters in the population and sample. AS/NZS 1284 requires that three phase meters should have two full load calculations (power factor of 1.0 and power factor of 0.5) and one light load calculation. Whereas single phase meters require testing at two load points. This means three phase meters should be in a separate population for testing by variables. Due to the fact that the additional three phase test point has not been used in the calculation the process is non-compliant.

As recorded in the February 2019 LMG MEP audit report, the process used in project 2 was non-compliant as the sample was not selected in accordance with AS/NZS 1284 because it was not representative of the meter population. The required sample size was 100, but the actual sample tested was 116. Only 100 results were considered. AS/NZS 1284.13 contains the following information indicating that all 116 results should be considered.
Section 8.4 (Selection of samples) states: *"It is recommended that the number of meters selected should be 10% more than the required sample size to allow for the replacements if some meters are damaged."*
Section 7.1.2 (Sampling accuracy by variables) states: *"Each meter in a sample shall be tested for accuracy in accordance with Clause 8.4."*
At the time of the LMG audit it was deemed that the first 100 meters which were used were not randomly selected and it was noted that there was a high proportion of inaccurate meters in the 16 meters not included. Clause 8.4 of AS/NZS 1284.13 requires the sample to be *"randomly selected to be representative of the selected meter population."*
It was also noted that there were two three phase meters amongst the 16 not included. The two three phase meters both had errors over 3% at the 0.5 power factor test point which could mean the entire population failed just on that issue. The standard states that all test points have equal weight, therefore the 0.5 power factor test point must be considered. Following discussion with the Authority during the review of the LMG audit Delta re-analysed the results for project 2 and re-issued the certification with a certification period reduced from seven years to two years. I checked the results of the re-analysis and found that Delta had completed a random selection of 100 meters from the 116 meters tested and used the 100 for analysis. The new certification is non-compliant as each meter in the sample was not used

in accordance with Section 7.1.2 of AS/NZS 1284 and the sample was not representative of the population due to the inclusion of two three phase meters.

The statistical recertifications completed for ARC and AMS were conducted under the alternative process published by the Authority on 17th December 2018. I checked the results of these recertifications and found they had followed the Authority's guidelines.

I have raised an issue in **section 5.45** relating to the statistical recertification of ARC installations which include data storage devices which do not comply with Part 10.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.26 With: Clause 16 of Schedule 10.7 From: 06-Jun-18 To: 22-Jun-20	Incorrect statistical sampling certification applied. Potential impact: High Actual impact: Medium Audit history: None Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	I have rated the controls as weak because the Delta process did not ensure correct selection of samples. The impact could be significant, as it is likely that inaccurate metering installations have been recertified. The audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
The non-compliances regarding stat sampling were due and error made by an employee that no longer works for DELTA. Post incident investigations were performed by the Electricity Authority and our process was found to ensure correct sample selection. The replacement ATH Compliance employee was also checked during this investigation and found to have a clear understanding of the selection process demonstrated by other stat sampling projects. At the time of the audit this had already been cleared so we find this unfair.	Complete	Disputed
Preventative actions taken to ensure no further issues will occur	**Completion date**	

The non-compliances regarding stat sampling were due and error made by an employee that no longer works for DELTA. Post incident investigations were performed by the Electricity Authority and our process was found to ensure correct sample selection. The replacement ATH Compliance employee was also checked during this investigation and found to have a clear understanding of the selection process demonstrated by other stat sampling projects.	Complete	

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

I checked the process and test results for the statistical sampling project which is currently in progress for the Delta MEP.

Audit commentary

Delta provided metering installation certification reports for 20 Category 1 metering installations where meters had been removed for the purpose of testing as part of a statistical sample recertification project. The certification reports confirmed that all 20 metering installations had been recertified using the selected component method.

Audit outcome

Compliant

5.28 Certification Validity Periods (Clause 17 of Schedule 10.7)

Code related audit information

A metering installation certification expiry date is the earliest of:
a) the date of commissioning plus the maximum certification validity period for the relevant category of metering installation, as set out in Table 1 of Schedule 10.1; or
b) the earliest metering component certification expiry date; or
c) a date determined by the ATH if the ATH believes that the circumstances and condition of the components in a metering installation warrant deviation from Table 1 of Schedule 10.1.
The expiry date for a metering installation in a group recertified using a statistical sampling process, is the earliest expiry date of the metering installations in the sample

Audit observation

I checked 63 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 63 metering installation certification records to confirm compliance.

Audit commentary

The process documentation stipulates the maximum permitted errors for certification. My checks of the certification records confirmed this had been applied correctly and the maximum error did not exceed the maximum permitted error.

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 22 metering installation certification records and examined the process for error calculation.

Audit commentary

Delta has reviewed and updated its uncertainty calculator for both the Comparative Recertification and Fully Calibrated methods since the previous audit. All sources of error are appropriately accounted for including temperature and load. The temperature is recorded on site and the calculator uses this to account for variation based on the test instrument temperature coefficient of ± 0.03% per degree Celsius. Load profile is accounted for by entering the estimated time the installation will spend at each load point and a weighted average is calculated and applied.

I found that the Category 4 installation at ICP 0000004199DE2DB had been certified using the Fully Calibrated method with the calculated uncertainty of 0.539% exceeding the maximum permitted uncertainty of 0.3% from Table 1 of Schedule 10.1.

Overall Installation Test Results (using meter pulse O/P)	Site Temperature (6.6 C to 34.4C for 3196)	10.9	Measured Error (Meter Output vs. Wkg Std)	-0.201%
	Measured Humidity (80% rh **Max** for 3196)	51%	Instrument Uncertainty at stated site conditions	0.539%
	Allowable Installation Error +/- (%)	1.25%	Calculated Total Installation Error (%)	0.740%
	(Cat 2 = 2.5%, Cat 3 & 4 = 1.25%, Cat 5 =0.75%)		**Overall Installation (Pass / Fail)**	**PASS**

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.30 With: Clause 22 Of Schedule 10.7 From: 01-Oct-19 To: 22-Jun-20	Uncertainty higher than 0.3% for 1 Cat 4 installation. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have rated the controls as moderate because the Delta process would not normally allow certification to occur in this situation. The impact on settlement is likely to be minor because the overall error is within the category limits.

Actions taken to resolve the issue	Completion date	Remedial action status
This ICP was mistakenly certified with completing the MR-007 error calculation sheet. This was identified and the site was revisited and recertified correctly before the audit as per the below result. 	Complete	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The MR-007 error calculation sheet is now used for all Cat 3 and 4 jobs.	Complete	

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 29 metering installation certification records, and process documentation.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 32 metering installation certification records, and process documentation.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

This clause is designed to allow switchboard manufacturers to install measuring transformers in switchboards at the time of manufacture. This clause does not allow the installation of meters or data loggers. Delta's testing process includes wiring checks which ensure compliance with this clause. Only CTs and test blocks are supplied, not meters.

Audit outcome

Compliant

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

Code related audit information

The ATH needs to determine the meter certification expiry date for each meter in a metering installation. The meter certification expiry date must be the earliest end date of the following periods, calculated from the date of commissioning of the metering installation:
a) the maximum metering installation certification validity period for the relevant category of metering installation; or
b) the maximum meter certification validity period set out in Table 2 of Schedule 10.1 for the relevant class of meter for the metering installation; or
c) the certification period specified in the meter certification report.

Audit observation

I checked 63 certification records to confirm compliance.

Audit commentary

All meter and metering installation certification expiry dates were correct.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 63 certification records to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

5.36 Measuring Transformers must be Certified (Clause 28(2) Of Schedule 10.7)

Code related audit information

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

Audit observation

I checked the certification records for 12 installations using the Selected Component and Fully Calibrated methods to confirm compliance.

Audit commentary

All 12 installations had certified measuring transformers. Delta has a clear understanding of this requirement.

Audit outcome

Compliant

5.37 Measuring Transformers used in a Certified Metering Installation (Clause 28(4) Of Schedule 10.7)

Code related audit information

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

Audit observation

I checked 29 certification records for installations containing current transformers, and process documentation to confirm compliance.

Audit commentary

The process documentation and design reports stipulate all of the requirements above. The certification reports confirmed compliance with regards to certification and burden. Delta's photo checking process also checks relevant items related to this clause.

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 certification records for 12 installations using the Selected Component and Fully Calibrated methods to confirm compliance.

Audit commentary

CTs supplied by TWS or VEMS are certified with a validity period table in the certification report and with appropriate stickers. Delta then calculates and records the expiry date.

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

Delta arranges for the installation of Control Period Demand metering on some Category 2 metering installations and in all cases, the metering installation is recertified in accordance with this clause.

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 29 metering installations to confirm compliance.

Audit commentary

Delta has not dealt with any changes to VT burdens.

Most new CTs are manufactured and certified by TWS. TWS has conducted testing and confirmed that CTs with ratios of 500/5 or greater will not be affected by low burden. Those under 500/5 may be affected by low burden as will non-TWS CTs. Delta has a documented process for the addition of burden resistors, and this has been used for all installations completed in the audit period. Burden resistors are installed in the current transformer secondary circuits at the meter terminals. My checks of the certification reports confirmed his was being carried out correctly.

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

There were no examples of alternative certification during the audit period.

Audit commentary

There were no examples of alternative certification during the audit period.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

I checked certification records for 32 metering installations to confirm compliance.

Audit commentary

Delta is certifying control devices and correctly applying stickers. The control device certification expiry date was correctly recorded in the installation certification reports for 19 of the 32 installations checked. There were 13 installations where the control device expiry date was incorrectly calculated. Six of these are Category 2 and above installations where the control devices were certified with expiry dates 15 years after the metering installation certification date. There were seven Category 1 installations where the control devices were certified with expiry dates prior to the metering installation certification expiry date.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 5.42 With: Clause 33(2) of Schedule 10.7 From: 06-Jun-18 To: 22-Jun-20	13 control devices certified with incorrect expiry dates. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	I have rated the controls as weak because the Delta process does not ensure expiry dates are correctly calculated. There is very little impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Delta will review all Cat2 and higher MICs completed during the period since the last ATH audit. Incorrect expiry dates will be amended and MIC reports reissued. Cat1 relay expiry dates were being incorrectly recorded based on the lab calibration/certification of the device causing them to expire before the ICP. Correct certification of the device was still performed during the install. These MIC reports will be amended and reissued.	30-10-2020	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
An automated certification process has been trialed during the period since Delta's last ATH audit. This has incorrectly certified LCDs for a period of 15 years based on a Cat1 timeframe. This new process was not reliable and has been abandoned, with Delta returning to manual entry of all expiry dates. Cat1 relay expiry dates are now being correctly recorded based on the field certification date.	Complete	

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

Code related audit information

In order to ensure control device accuracy or the completeness of reconciliation information, the ATH must determine the likelihood of the control device not receiving control signals before it certifies a metering installation incorporating a control device.
If the ATH believes the likelihood of the control device not receiving control signals would affect the accuracy or completeness of the information for consumption reconciliation, the ATH may certify the remainder of the metering components and the installation, excluding the control device. The ATH must advise the MEP within three business days of its decision. The MEP is then responsible for advising both the reconciliation participant for the POC for the metering installation and the control signal provider of the ATH's determination.

Audit observation

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

Audit commentary

Delta has liaised with distributors over this matter and the response indicates there are no areas with signal propagation issues where Delta operates as an ATH.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked processes and the records for 27 metering installations to confirm compliance.

Audit commentary

All data storage devices are recertified prior to be reinstalled.

Audit outcome

Compliant

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

Code related audit information

An ATH must ensure that each data storage device in the metering installation:
- is installed so that on-site interrogation is possible without the need to interfere with seals
- has a dedicated power supply unless the data storage device is integrated with another metering component
- is compatible with each other metering component of the metering installation
- is suitable for the electrical and environmental site conditions in which it is installed
- has all of its outputs and inputs appropriately electrically isolated and rated for purpose
- has no outputs that will interfere with the operation of the metering installation
- records periods of data identifiable or deducible by both date and time on interrogation
- has memory capacity and functionality that is suitable for the proposed functions of the data storage device specified in the design report for the metering installation
- has availability of memory for a period that is suitable for the proposed functions as set out in the design report for the metering installation, and at least for a minimum continuous period of 15 days.
The data storage device must have an event log which records the following:
a) loss of power supply
b) critical internal alarms
c) meter phase failure if integral to the meter
d) software configuration changes
e) a record of time changes.

Audit observation

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

Audit commentary

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

During the audit period Delta completed recertification of a population of 85,533 meters for ARC Innovations under the alternative process published by the Authority on 17th December 2018. Delta provided a copy of the type test for the data logger used in these installations which states that the "Data Logger retains all data pertaining to energy and events for a minimum period of the interrogation cycle plus five days". The interrogation cycle is one day; therefore, the type test has confirmed that data will be retained for six days. This type test was conducted under the Electricity Governance Rules, Code of Practice D4 which were in place at the time of installation. Clause 5(b)(xii) of Schedule 10.8 now requires "that the data storage device has data loss protection providing a continued clock and memory operation for a continuous period of at least 15 days when the power supply to the data storage device is lost". As the Code is unclear on the requirements for certification of data storage devices when statistical recertification is conducted, I have raised this as an issue to be considered by the Authority.

Issue	Description
Regarding: Clause 38(1) and (2) of Schedule 10.7 and clause 5(1) of Schedule 10.8	Certification of data storage devices when statistical recertification is conducted The code requires data storage devices to meet the requirements of clause 38(1) and (2) of Schedule 10.7 and clause 5(1) of Schedule 10.8. It is unclear how this should be applied when conducting recertification by statistical recertification under clause 16 of Schedule 10.7.

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 four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

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 Delta 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 four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

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

Audit outcome

Compliant

5.49 Enclosures (Clause 42 of Schedule 10.7)

Code related audit information

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

Audit observation

I checked the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

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

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the processes for storage of components, and the records for 63 metering installations to confirm compliance.

Audit commentary

Delta conducts calibration of components in their laboratory and they have appropriate arrangements for storage and transportation. Delta 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 the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

An ATH must use a sealing system that enables identification of:
- the ATH who affixed the seal
- the person (or the sealing tool) who applied the seal
- when the seal was applied.

Audit observation

I checked process documentation, design reports and the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

The process documentation, design reports and the photos for four metering installations confirm compliance. The certification records contain the relevant details required by this clause.

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 to confirm compliance. There were no specific examples available to check.

Audit commentary

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

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 1 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, MEP specific instructions, design reports and the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

Audit commentary

The process documentation, MEP specific instructions, design reports and the photos for four metering installations confirm compliance.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, MEP specific instructions, design reports and the photos for four metering installations to confirm compliance. A small sample was considered appropriate because Delta has a photo checking process for all field activity which includes this point.

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 63 certification reports to confirm compliance.

Audit commentary

All certified components have calibration reports and stickers.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and 63 certification reports to confirm compliance.

Audit commentary

All certified components have calibration reports and stickers.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Delta's Class B ATH does not calibrate components.

Audit commentary

Delta's Class B ATH does not calibrate components.

Audit outcome

Not applicable

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

Code related audit information

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

- no less than the test points in Table 5 of Schedule 10.1 or

- sufficient to calculate the metering installation error as defined in clause 22 of Schedule 10.7.

Audit observation

I checked the test points used by Delta.

Audit commentary

Delta's uses the test points stipulated in the relevant standards.

Audit outcome

Compliant

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

Code related audit information

An ATH must, when calibrating a metering component:

- if necessary, adjust and document the error compensation

- ensure that any adjustment carried out is appropriate to achieve an error as close as practicable to zero

- ensure that the uncertainty of measurement during the calibration of the metering component does not exceed one third of the maximum permitted error in the relevant standard listed in Table 5 of Schedule 10.1.

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

Audit observation

I checked Delta's IANZ report to confirm compliance.

Audit commentary

The IANZ report confirms compliance with these points.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Delta's Class B ATH does not calibrate components.

Audit commentary

Delta's Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.63 Meter Certification (Clause 1 of Schedule 10.8)

Code related audit information

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

Audit observation

I checked the certification records for 63 metering installations and Delta's directory of type test reports to confirm compliance.

Audit commentary

All meters are certified, and Delta has a directory of type test reports to confirm compliance with this requirement.

Audit outcome

Compliant

5.64 Meter Requirements when meter is relocated (Clause 26(2) Of Schedule 10.7 and Clause 43(2) Of Schedule 10.7)

Code related audit information

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

Audit observation

I checked the process documentation in relation to this clause.

Audit commentary

This clause is designed to allow builder's temporary supplies to be portable without the need to calibrate the meter every time. Delta ensures that all removed meters are recalibrated before being reinstalled in another metering installation.

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

It is rare for Delta to certify CTs, but the process documentation is compliant.

Audit commentary

It is rare for Delta to certify CTs, but the process documentation is compliant.

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 metering installations and in all cases, the CTs were pre-certified by TWS or VEMS. It is rare for Delta to certify CTs, but the process documentation is compliant.

Audit commentary

I checked the certification records for 12 metering installations and in all cases, the CTs were pre-certified by TWS or VEMS. It is rare for Delta to certify CTs, but the process documentation is compliant.

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

I checked design reports, process documentation and the certification records for 29 metering installations to confirm compliance.

Audit commentary

TWS has confirmed that some CTs will operate accurately at low burden. Delta has a documented process for the addition of burden resistors, and this has been used for all installations completed in the audit period. Burden resistors are installed in the current transformer secondary circuits at the meter terminals. My checks of the certification reports confirmed this was being carried out correctly.

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 policy regarding epoxy CTs.

Audit commentary

Epoxy insulated CTs are discarded upon discovery.

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 32 metering installations to confirm compliance.

Audit commentary

Delta certifies control devices in accordance with these clauses. The certification report is combined with the metering installation certification report and contains the required details. I have recorded in **section 5.42**, that there were 13 installations where the control device expiry date was incorrectly calculated.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the certification records for 32 metering installations and the process documentation to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

An ATH may only calibrate a metering component on site in the metering component's normal environment by measuring the influence of all on-site variables and including their estimated effects in the uncertainty calculation. An ATH must ensure that:
- the effects of any departures from the reference conditions can accurately and reliably be calculated
- the metering installation, in which the metering component is incorporated, is within the applicable accuracy tolerances set out in Table 1 of Schedule 10.1 after taking into account all known influences including temperature and temperature co-efficient measurements.

Audit observation

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

Audit commentary

Delta 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

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

Audit commentary

Delta 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

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

Audit commentary

Delta 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 32 metering installations to confirm compliance.

Audit commentary

Delta is correctly applying certification in accordance with this clause.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the records for 63 metering installations to confirm compliance.

Audit commentary

There was no evidence of incomplete functions.

Audit outcome

Compliant

6. INSPECTION OF METERING INSTALLATIONS

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

Code related audit information

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

- check and confirm that the data storage device in the metering installation operates as required

- check and confirm that the expected remaining lifetime of each battery in the metering installation will be reasonably likely to meet or exceed the metering installation certification expiry date

- ensure that no modifications have been made to the metering installation without the change having been documented and certification requirements satisfied

- visually inspect all seals, enclosures, metering components, and wiring of the metering installation for evidence of damage, deterioration, or tampering

- ensure that the metering installation and its metering components carry appropriate certification stickers.

Audit observation

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

Audit commentary

Delta has appropriate process documentation for conducting inspections, and their records are compliant with these clauses.

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 the content of the standard inspection reports to confirm compliance.

Audit commentary

Delta has not conducted any Category 1 inspections where data storage devices are present.

Audit outcome

Not applicable

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

Code related audit information

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

- details of the checks carried out, the results, and the installation certification expiry date

- the serial numbers of all components in the metering installation

- any non-compliances and the action taken to remedy the non-compliance

- the name of the inspector and the date on the inspection.

Audit observation

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

Audit commentary

Delta's inspection reports contain all of the relevant information above.

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

Delta was also the MEP for the inspections I checked, so the inspection reports were provided to the MEP on the day of the inspection. There were no examples of inspections completed for other MEPs.

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 the content of the standard inspection reports to confirm compliance.

Audit commentary

Delta's inspection reports contain all of the relevant information above. There were no examples of Category 2 and above inspections completed during the audit period.

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 Delta's process documentation and checked if there were any examples during the audit period.

Audit commentary

Delta has a process which is compliant with the Code. There were no examples available to examine during the audit period.

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 Delta's process documentation and checked if there were any examples during the audit period.

Audit commentary

No specific examples of faulty metering installations have been identified. Delta has a process which is compliant with the Code. I viewed Delta's Statement of Situation form and confirmed that it includes all relevant detail.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked Delta's process documentation and checked if there were any examples during the audit period.

Audit commentary

No specific examples of faulty metering installations have been identified. Delta has a process which is compliant with the Code. I viewed Delta's Statement of Situation form and confirmed that it includes all relevant detail.

Audit outcome

Compliant

7.4 Correction of Defects (Clause 10.47 of Part 10)

Code related audit information

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

Audit observation

I checked Delta's process documentation and checked if there were any examples during the audit period.

Audit commentary

No specific examples of faulty metering installations have been identified. Delta has a process which is compliant with the Code. The process requires that all modifications carried out on-site are recorded by the technician.

Audit outcome

Compliant

8. Conclusions

Since the previous audit Delta has improved the clarity of its certification reports, added a process for applying burden to current transformers and reviewed the processes for calculation of error and uncertainty.

Ten non-compliances have been recorded.
Five of the non-compliances relate to incorrect or missing information being recorded on metering installation certification reports and the late provision of certification reports to MEPs.

Non-compliance has been recorded in relation to the selection of samples for the statistical recertification. I have also raised the issue of recertification by statistical sampling of installations which include data storage devices as the Code is not clear in this area.

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 of 25 indicates a next audit frequency of six months and I agree with this recommendation.

9. Delta Response

The Delta ATH accept the results of the audit with the exception of:

5.26 – Statistical Sampling. This issue has already been resolved and cleared by the time of our ATH audit. Therefore, we find it unfair to be included as a non-compliance.

Delta acknowledge the feedback and instruction provided by the auditor and aim to continue to make improvements to deliver accurate ATH certification services.