VERITEK

Electricity Industry Participation Code Audit Report

For

METRIX™

Class A and B
Approved Test House

Prepared by Steve Woods – Veritek Limited

Date of Audit: 11/04/17

Date Audit Report Complete: 08/05/17

Executive Summary

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

This audit found a high level of compliance. All of the issues from the previous audit have been resolved, and this audit identified two new non-compliance issues and three recommendations are made.

Metrix has not kept up momentum with their subcontractor audit regime and there are currently no field audits being conducted. I've rated this as a medium potential risk as there are only a small number of contractors engaged by the Metrix ATH and they have performed well in the past. The level of control is rated as moderate rather than weak because there are reviews performed of Category 2 certification reports.

The matter of low CT burden is also rated as a medium risk because CT metered installations could be recording inaccurately and this could lead to inaccurate submission information. The level of control is moderate because Metrix has conducted some informal testing to determine the impact of low burden.

The matters found are shown in the tables below:

Table of Non Compliance

Subject	Section	Clause	Non compliance	Risk rating	Control rating	Risk score	Audit History	Procedures	Remedial action
Use of contractors	3.1	10.3(1) of part 10	Subcontractor management practices do not ensure all contractors have the required skill and expertise in accordance with the Code.	Medium	Moderate	4	None	Need improvement	Identified
CT burden	4.19.6	20(1)(b) of schedule 10.7	Metrix has not confirmed the accuracy of non-TWS CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard.	Medium	Moderate	4	None	Need improvement	Disputed

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Remedial Action
Use of contractors	3.1	10.4(1) of part 10	Prepare a summary table showing all contractors and their training and competence status.	Identified
ATH requirements	3.5	10.41 of part 10	Include PPE use and management in field audits.	Identified
Inspections	6.1	44 of schedule 10.7	Develop a process for inspecting Category 1 installations with data storage devices.	Identified

Persons Involved in This Audit

Auditor:

Steve Woods
Veritek Limited
Electricity Authority Approved Auditor

Metrix personnel assisting in this audit were:

Name	Title
Chris Chambers	Compliance Coordinator
Brett Piskulic	ATH Support Coordinator

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1. Scope of Audit

Metrix 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 audit was conducted in accordance with an ATH Audit Guideline prepared by Veritek Limited.

Metrix provides laboratory testing services to other MEPs. Metrix also provides services in relation to calibration of working standards owned by other parties. All Class A installation work is subcontracted to other Class A ATHs.

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

Metrix 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:

(h) inspection of metering installations.

Metrix 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

(b) installation and modification of metering installations:

(c) installation and modification of metering components:

(d) calibration of metering components on site:

(e) certification, using the selected component certification method, of:
- (i) category 1 metering installations:
- (ii) category 2 metering installations:
- (iii) category 3 metering installations with a primary voltage of less than 1kV:

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

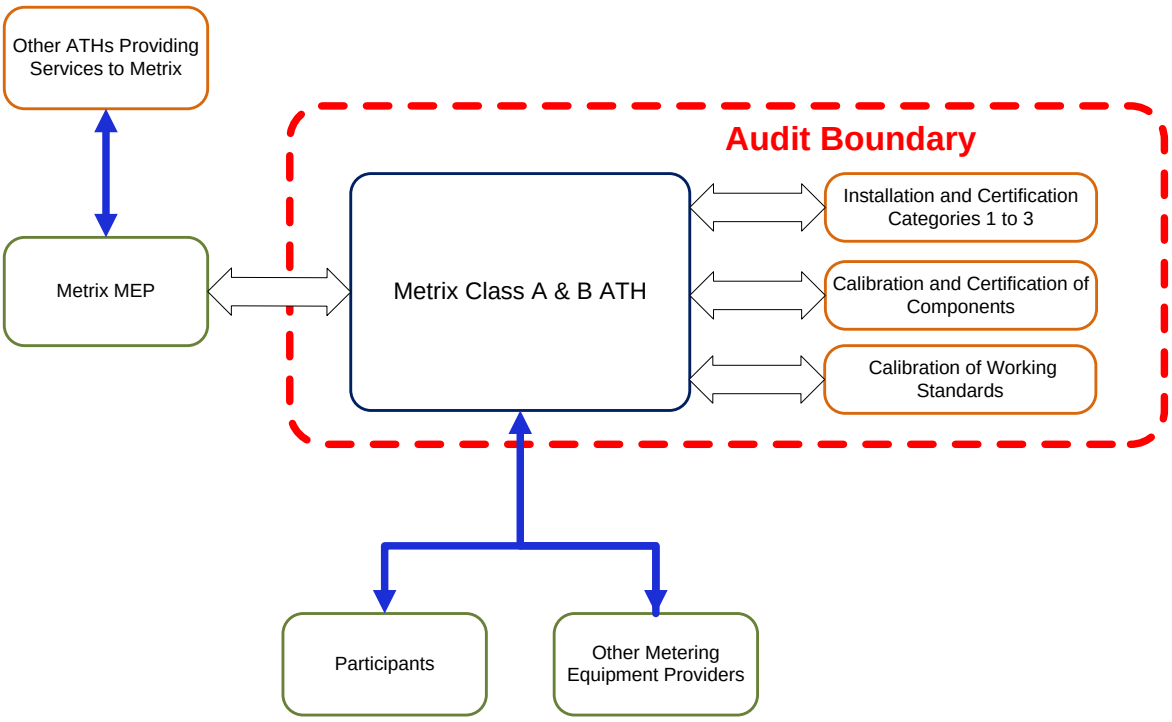
(h) issuing of certification reports in respect of certifications of metering installations under paragraphs (e) to (g):

(i) inspection of:
- (i) category 1 metering installations:
- (ii) category 2 metering installations:
- (iii) category 3 metering installations with a primary voltage of less than 1kV.

Metrix 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.

As a Class B ATH Metrix performs certification work predominantly within the Vector Network (Auckland) region.

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



2. Previous Audit Results

The last audit was conducted in February 2014 by Steve Woods of Veritek Limited. The table below shows all issues are now cleared.

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Selected component certification	4.9	11(5)(c) of schedule 10.7	Register advance check not conducted.	Cleared
Comparative certification	4.10	12(3)(b) & 22 of schedule 10.7	Comparative recertification conducted without considering all site specific conditions and by using class accuracy for working standards and clamps.	Cleared
Metering component stickers	4.21	8 of schedule 10.8	Control devices do not have certification stickers.	Cleared
Control signals	4.25.1	34(1) of schedule 10.7	Check not made to determine if control device is likely to receive a signal.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Sealing tool register	3.13	9 of schedule 10.4	Check and update sealing tool register.	Cleared
Insufficient load	4.12	14 of schedule 10.7	Ensure Category 2 metering installations are certified at the time of livening.	Cleared
Enclosures	4.22	42 of schedule 10.7	Develop a separate warning label for CT chambers.	Cleared

3. ATH Requirements

3.1 Use of Contractors (Clause 10.3 of Part 10)

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.

Metrix uses a combination of employees and subcontractors to conduct certification activities. New contractors are assessed through an examination after a training session. Training is tailored to the individual and accreditation is only granted when the individual is considered competent. Each contractor has a training record, acknowledged by them through a signature, showing the content of the training, the trainer and the date. Whilst the training records are detailed and up to date, I recommend an overall summary table is prepared showing all contractors and their approval status.

Recommendation	Description	Audited party comment	Remedial action
Regarding: Clause 10.4(1) of part 10	Prepare a summary table showing all contractors and their training and competence status.	Metrix is in the process of developing a new Contractor Training Management tool within the "ChargeUp" system. A table of this type could be accommodated within the design.	Identified

The Code states that Metrix "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." The initial training of subcontractors is considered appropriate to determine competence when a contractor is first engaged. However the field auditing of contractors is no longer being conducted and I have therefore concluded that compliance is not achieved because Metrix cannot be sure each contractor continues to have the specified level of skill and expertise without an audit regime. I've rated this as a medium potential risk as there are only a small number of contractors engaged by the Metrix ATH and they have performed well in the past. The level of control is rated as moderate rather than weak because there are reviews performed of Category 2 certification reports.

Non-compliance	Description		
With: Clause 10.3(1) of part 10 From/to: Entire audit period	Subcontractor management practices do not ensure all contractors have the required skill and expertise in accordance with the Code. Risk Rating: Medium Adequacy of Controls: Moderate Audit history: None Procedures: Need improvement		
Actions taken to resolve the issue		Completion date	Remedial action Status
Metrix acknowledges that field auditing of contractors has not been maintained in recent times. Metrix intends to implement audits and provide ongoing refresher training for technicians working under the Metrix Class B Test House.		6 months	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Metrix will implement a contractor audit timetable to ensure that audits are conducted at regular intervals		6 months	

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

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.

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

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

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

3.4 ATH Approval (Clause 10.40 of Part 10)

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.

Metrix has appropriate approval and appropriate facilities and procedures to meet the minimum requirements of the Code. Compliance is confirmed.

3.5 ATH Requirements (Clause 10.41 of Part 10)

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.

Metrix has only conducted activities that fall within the scope of their approval. I have concluded from this audit that Metrix 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:

- Livening practices, specifically polarity testing. This is a required step in the process and is recorded appropriately.
- Safety practices with regard to the management of asbestos switchboards. Work is not currently being conducted on asbestos switchboards because the process is under review.
- General safety practices and the appropriate use and testing of personal protective equipment. PPE management and use is prescribed. I recommend this area is included in field audits once these are re-instated.

Recommendation	Description	Audited party comment	Remedial action
Regarding: Clause 10.41 of part 10	Include PPE use and management in field audits.	Metrix can include PPE use and management in its field audit programme	Identified

3.6 Quality Management Systems (Clauses 3(1) & 4(1) of Schedule 10.3 & Clause 16 of Schedule 10.4)

Metrix provided a copy of the report for the most recent ISO 9001:2008 audit, conducted in October 2016 by Telarc SAI Limited. The scope of the ISO 9001: 2008 registration is appropriate and includes:

To perform Test House Functions, as defined by the scope of the Metrix Test House Electricity Authority registration, in accordance with part 10 and part 15 of the Electricity industry participation code 2010.

The report contained three opportunities for improvement, which are shown in the table below:

Opportunity for improvement	Metrix response
In preparation for a move to ISO 9001: 2015 it is suggested that management start working on identifying Business Risk and establishing plans to mitigate the Risk	Metrix will start work on identifying Business Risk and establishing plans to mitigate the Risk, as it applies to the Metrix ATH, as an element of preparation to comply with the new (2016) ISO 9001 standard
It is suggested that management start working on identifying all key interested parties and identifying and mitigating the risk associated with dealing with them.	Metrix has spent a significant amount of effort identifying all of its key interested parties; These are, among others: • Key Account Managers have been assigned to all of its Retail (Trader) customers no matter how small, or large. Their role includes managing the relationship, and dealing with each and every issue and escalations • Metrix has key contacts within the BIQ Team, MEP Team and Assets and ICT Team assigned to

	manage communications with the Electricty Authority • Metrix has key contact assigned to manage our Deployment contractor (Wells) Metrix will start work on identifying any additional key interested parties and identifying and mitigating the risk associated with dealing with them, as it applies to the Metrix ATH, as an element of preparation to comply with the new (2016) ISO 9001 standard
It is suggested that knowledge gleaned from an individual's work history be captured within the organisation while the individual is still employed by the company and able to impart this knowledge into general use	Metrix Field Technicians have many decades of wisdom and experience to impart. To mitigate the risk associated with staff turnover, processes are well documented, and there are younger field technicians in the team, who regularly "buddy up" and work in tandem with older, more experienced staff. During the current Category 2 recertification program, and the forthcoming category 1 inspection project, this is particularly evident. The Learning Management System "Charge Up" is designed to capture Team Training for all Metrix teams.

Metrix also provided a copy of the report for the most recent ISO 17025: 2005 audit, conducted in November 2016 by IANZ.

The scope of their ISO 17025: 2005 certification is appropriate and is notes as:

Programme: Metrology and Calibration Laboratory
Sub Fields: Energy meter and current transformer calibration
The executive summary contained the following statement:

There were no Corrective Action Requests (CARs) raised and the assessment found the laboratory was in compliance with the requirements of accreditation. This is an excellent outcome and is reflective of the professional and proactive approach to accuracy and improvements of the organisation.

This report contained three recommendations, as shown in the table below.

Recommendation	Metrix response
It is recommended that the laboratory corrects clause 1.6 in the document TL-01 Control of Calibration Certificates, which refers to subcontracted results requirements for test reports, not calibration reports (5.10.6). The laboratory is reminded to consider the distinction when conducting internal audits and other reviews of documentation and compliance	This matter is now resolved with a change to the wording.

For endorsed reports it is strongly recommended (5.10) that: a. The error in the reference to IEC 60044-1 is corrected in the CT report templates; b. A field is added to the CT report templates for reporting the CT's class (or other means of ensuring it is always reported).	Metrix intends to make this change.
Further to the above, for endorsed reports it is recommended that: a. Traceability is stated to the International System of Units (SI) rather than National Standards (the path of traceability may also be mentioned if desired); b. The names of the staff members signing reports are added to the templates.	This recommendation was adopted and resolved.

3.7 Organisation and Management (Clause 15 of Schedule 10.4)

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.

Roles and responsibilities are documented in the relevant position descriptions and the authority and resources are available to ensure the ATH functions as intended.

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. Chris Chambers is the Quality Manager and Brett Piskulic is the Technical Manager. Chris and Brett have appropriate qualifications.

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

3.8 Accommodation & Environment (Clause 1 of Schedule 10.4)

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.

Access to the laboratory and storage area is restricted. There is a list of authorised personnel on the laboratory door, as shown in the photo below. Compliance is confirmed.

3.9 Test Equipment (Clause 2 of Schedule 10.4)

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. Metrix has a "lab maintenance" database containing records of any repairs and maintenance and includes the status of all items of equipment. This database is actively used and is up to date. I discuss working standards in Section 3.10.

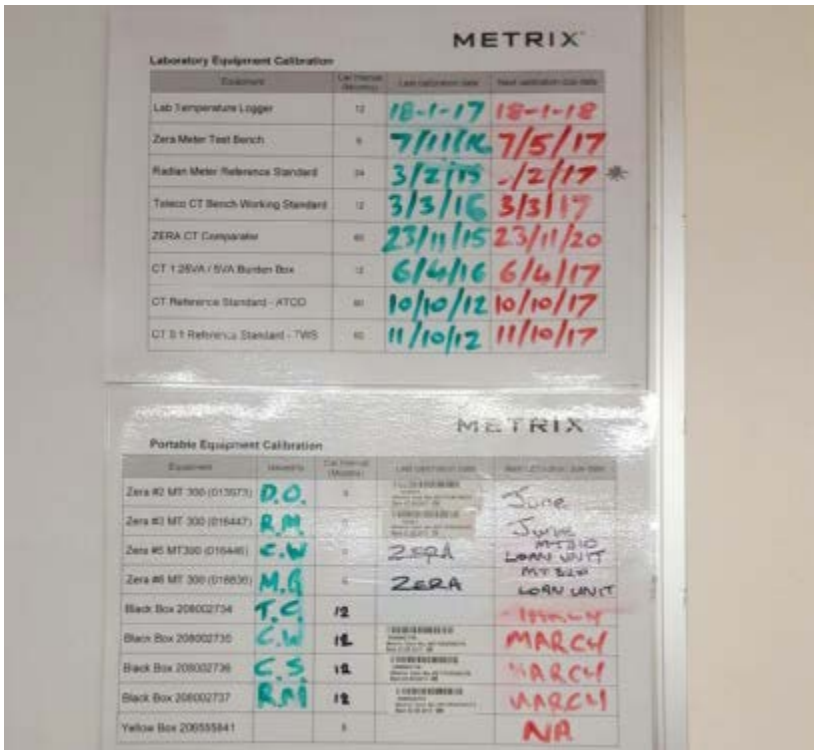
A class B ATH must have and maintain procedures for the purchase of test equipment and associated consumables. The relevant operating procedure was demonstrated during the audit. The relevant consumables are seals, and stickers. Compliance is confirmed.

3.10 Calibration of Reference & Working Standards (Clause 3 of Schedule 10.4)

A working standard is a standard that has been calibrated by an ATH or a calibration laboratory that is used routinely for the calibration of metering components and metering installations.

I checked the calibration records for all working standards and reference standards. All standards had current calibration reports. The Radian (RM-11-07) reference standard is calibrated every two years by MSL. All field working standards are calibrated against the Radian standard on a 12 monthly basis. The Zera 10 position bench (ED8582), is checked every six months in addition to the normal calibration schedule.

Metrix has all relevant records relating to the maintenance, repairs and calibration dates. They also have a whiteboard in the laboratory with the dates so they are visible to all personnel. The photo below shows this whiteboard.



3.11 Calibration Errors (Clause 5 of Schedule 10.4)

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.

One Zera MT300 working standard failed calibration and has been sent back to Zera for repair. This raises the question regarding what steps are now required to ensure compliance is achieved. Firstly I considered clause 3 of schedule 10.4, which requires standards to be calibrated before they are used. This standard had a current calibration report when it was being used in the field. The next clause I considered was clause 5(2) of schedule 10.4 which requires ATHs to stop using a working standard if it has a calibration error. Metrix did stop using the standard so compliance is achieved with this clause. Clause 5(3) requires the ATH to investigate and quantify the error, which they have done. Clause 5(4) requires the ATH to treat all installations certified with the standard as outside the tolerances in table 1 and to comply with clause 10.43. Clause 10.43 requires the participant (Metrix in this case) to notify the MEP, which has occurred because Metrix is also the MEP. Metrix as an MEP now has some responsibilities to ensure the working standard and therefore metering installation potential error is quantified; however Metrix as an ATH has met their responsibilities. Compliance is confirmed.

3.12 Calibration Methods (Clause 7 of Schedule 10.4)

An ATH must only use components that have been certified by an ATH or calibration laboratory. Metrix only uses certified components. Measuring transformers are certified by the manufacturer and most meters and data storage devices are certified by the Metrix Class A ATH.

A Class B ATH must follow 17025 calibration methods for components. All calibration is conducted by the Metrix Class A ATH.

The test points must be those listed in the relevant IEC standard. This was confirmed during the audit by checking a calibration report for single phase meters, three phase meters and CTs.

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. This was confirmed during the audit by checking the calibration reports as mentioned above.

If a CT is to be used in a Metering Installation certified using the selected component method then it must be tested for errors at 5% to 120% of rated current. I checked a calibration report which confirmed compliance with this clause.

An ATH must have documented instructions for calibration that match the IEC standard. Each item of test equipment has its own documented and prescribed methods of operation for testing components. Compliance is confirmed.

The documentation for field activities was also reviewed. This is comprehensive and compliant with this clause.

3.13 Sealing and Monitoring of Seals (Clause 9 of Schedule 10.4)

An ATH must have a documented system for applying seals to a metering installation that meets the requirements of clause 47 of Schedule 10.7; and is appropriate in the circumstances to ensure:

- The ATH's ability to monitor the metering installation's continued integrity
- The relevant metering equipment provider is alerted as soon as practicable to any unauthorised access to the metering installation.

When a seal is discovered to be broken or missing there is a procedure that ensures the MEP is notified. There is an appropriate policy and procedures contained in the quality manual in relation to the management of sealing. I checked an example where a seal was found to be broken at ICP 0241134544LC122, and the on-site investigation confirmed tampering. The installation was re-certified and a statement of situation was provided to the MEP. Compliance is confirmed for this process.

During the audit it was confirmed that the appropriate records were held in the sealing tool register for one sealing tool issued to a field technician. Metrix conducts an annual audit of the sealing tool register to ensure it is accurate. The most recent audit was conducted in February 2017. Compliance is confirmed.

3.14 Services Access Interface (Clause 10 of Schedule 10.4)

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.

The location of the Services Access Interface is recorded in the certification reports as required by this clause. I checked 20 examples during the audit. Compliance is confirmed.

3.15 Certification & Calibration Reports (Clause 11 of Schedule 10.4)

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.

Certification and calibration reports are available for all metering installations and components where necessary. I reviewed 20 of these during the audit. Compliance is confirmed.

4. Requirements of Metering Installations

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

Reconciliation participants are responsible for the physical location of metering installations. 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.

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

4.2 Faulty Metering Installations

4.2.1 Investigation of Faulty Metering Installations (Clause 10.43 of Part 10)

If an ATH becomes aware of an event or circumstance that leads it to believe a metering installation is or could be inaccurate, defective or not fit for purpose, they must notify the MEP.

Metrix has a documented process which is compliant with the Code. I checked an example where a measuring transformer was insecurely mounted at ICP 0211262005LC860 and the CTs were subsequently replaced. The MEP (also Metrix) was notified immediately when the CT mounting bracket was found to be insecure. I checked another example where a seal was found to be broken at ICP 0241134544LC122, and the on-site investigation confirmed tampering. The installation was re-certified and a statement of situation was provided to the MEP. The third example was where the neutral and earth conductors had been run through the one of the CTs at ICP 0335039103LC94A. In an unbalanced situation this will cause inaccurate measuring of consumption but it is not able to be quantified. A statement of situation was provided in accordance with the Code.

Compliance is confirmed.

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

If a report prepared under clause 10.43(4)(c) demonstrates that a metering installation is inaccurate, defective, or not fit for purpose, the MEP must arrange for an ATH to test the metering installation and provide a ‘statement of situation’.

If the MEP is advised by a participant under clause 10.44(2)(a) that the participant disagrees that the report that demonstrates that the metering installation is accurate, not defective and fit for purpose, the MEP must arrange for an ATH to:

- Test the metering installation
- Provide the MEP with a statement of situation within five business days of:
    - Becoming aware that the metering installation may be inaccurate, defective or not fit for purpose: or
    - Reaching an agreement with the participant.

The MEP is responsible for ensuring the ATH carries out testing as soon as practical and provides a statement of situation.

Statements of situation were provided for the three ICPs mentioned in Section 4.2.1. Compliance is confirmed.

4.2.3 Statement of Situation (Clause 10.46 of Part 10)

A statement of situation provided by an ATH under clause 10.44(1)(b) must include:

a) Details of the tests carried out

b) Results of the tests carried out

c) Full details of what was found

d) Conclusions of whether the metering installation is accurate, defective, fit for purpose and the reasons for the conclusions in paragraph (d)

e) An assessment of the risk to the completeness and accuracy of the raw meter data

f) The details of any remedial action proposed or undertaken

g) Any correction factors to apply to raw meter data to ensure that the volume information is accurate

h) The period over which the correction factor must be applied to the raw meter data.

An MEP must, within three business days of receiving the statement of situation, provide copies of it to the relevant affected participants and the market administrator.

Three statements of situation were checked, as mentioned in Section 4.2.1. All of the requirements listed above were included. For ICP 0211262005LC860 there was no effect on consumption information. For ICP 0241134544LC122 the installation was recording 29% low. It was not possible to determine the inaccuracy for ICP 0335039103LC94A.

Compliance is confirmed.

4.2.4 Correction of Defects (Clause 10.47 of Part 10)

An ATH must, when taking action to remedy an inaccuracy or defect within a metering installation, 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.

Metrix provided the records for the three ICPs mentioned in the sections above. Compliance is confirmed.

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

A certifying ATH must, before it certifies a new or modified metering installation, check and approve, in writing, the design report provided under clause 2 (including the configuration scheme and the schematic drawing), to ensure that the proposed new or modified metering installation will function correctly and will provide the required accuracy and complies with this Part.

The Metrix MEP and ATH operations are combined with regard to the majority of design reports and they are all appropriate and approved by the ATH. Metrix conducts some certification activities where AMCI is the MEP and they use the Metrix design reports for these installations. I checked the three most common design reports, which are single phase controlled, single phase uncontrolled and CT metered. Compliance is confirmed.

4.4 Determination of Metering Categories (Clause 5 of Schedule 10.7)

An ATH must, before it certifies a metering installation, determine the category of the metering installation in accordance with the following:

- Subject to clause 6, if the metering installation incorporates a current transformer, its category must be determined according to the primary current rating of the current transformer and the connected voltage set out in Table 1 of Schedule 10.1:

- If the metering installation does not incorporate a current transformer and the quantity of electricity conveyed is measured by a meter, it must be category 1.

I checked 20 certification records and confirm compliance with this clause because all metering categories were correct.

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

A category 2 or higher metering installation may be certified at a lower category than would be indicated solely on the primary rating of the current if:

- Protection is lower than the maximum allowable primary rating

- The MEP, based on historical metering data, reasonably believes that the maximum current will at all times during the intended certification period be lower than the current setting of the protection device for the category for which the metering installation is certified, or is required to be certified by the Code

- The MEP, based on historical metering data, reasonably believes that the metering installation will use less than 0.5 GWh in any 12 month period.

If an ATH determines the category of a metering installation based on protection being lower than the maximum allowable primary rating, the ATH must, when certifying the metering installation, determine the category of the metering installation by reference to the maximum current setting of the protection device. The ATH must, when doing so:

- Confirm the suitability and operational condition of the protection device

- Record, in the metering records, the rating and setting of the protection device
- Seal the protection device; and, if practicable, attach a warning tag to the seal.

If an ATH determines the category of a metering installation based on maximum demand the ATH may, only if it considers it appropriate in the circumstances, at the request of the metering equipment provider, determine the metering installation category according to the metering installation's expected maximum current. If the ATH determines the category of a metering installation under this clause, then the MEP must monitor the demand on a monthly basis.

If an ATH determines the category of a metering installation based on consumption, the ATH must ensure all LV installations are Category 2 and all HV installations are Category 3. If the ATH determines the category of a metering installation under this clause, then the MEP must monitor the consumption on a monthly basis.

I checked a recent certification in accordance with this clause for ICP 0216378001LC287. The certification report states that monitoring must occur by the MEP. The load of the installation was checked and was approx. 100A, so it's reasonable for this installation to be certified as Category 2. Compliance is confirmed.

4.6 Metering Installation Certification Requirements (Clause 8 of Schedule 10.7)

An ATH must, when certifying a metering installation prepare a certification report for the metering installation, which contains the following information:

1. Whether the installation is HHR or NHH
2. The location of the services access interface
3. Confirmation that each metering component functions correctly
4. Confirmation that HHR meters are installed on installations above Category 2
5. The category of the metering installation.

I checked the certification records for 20 metering installations and the points noted above were included in all cases. Compliance is confirmed.

4.7 Certification Tests (Clause 9 of Schedule 10.7)

An ATH must consider the following points when carrying out a test set out in Table 3 or 4 of Schedule 10.1:

- Prevailing load tests must be conducted on a metering installation or metering component by using a working standard connected to the metering installation. Prevailing load tests for comparative recertification are conducted using a working standard.

- Installation or component configuration tests must ensure that the actual configuration scheme is the same as the scheme for the metering installation or metering component recorded in the design report. The design report reference is included in certification records and this serves the purpose of confirming the configuration scheme.

- Raw meter data output tests for a category 1 metering installations or category 2 metering installations, must be conducted by applying a measured increase in load and measuring the increment of the sum of the meter registers, or the accumulation of pulses resulting from the increase in load. Load tests are conducted in accordance with this clause and the certification record contains the calculated and measured results.

- Raw meter data output tests for a HHR metering installation which are category 1 or category 2 must be conducted by either:

    - Comparing the output from a working standard to the raw meter data from the metering installation for a minimum of one trading period. This test is conducted for Category 2 HHR installations.
    - 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. This process is not conducted because Metrix MEP does not conduct a sum-check.

- 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 1 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.

If an ATH performs a raw meter data output test, for a metering installation that will be certified for remote meter reading, the ATH must obtain the raw meter data from the back office system where the raw meter data is held or 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. The MEP back office checks that a meter reading is the same or more than that recorded on site. This achieves compliance with clause 1A of Clause 9.

If an ATH performs a test that requires a comparison between 2 quantities, the ATH must not certify the metering installation unless the metering installation passes the test. A metering installation

passes if 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.

Calibration tests (for example comparative certification tests) will have an accuracy within the tolerances of Table 1, but commissioning tests (for example raw meter data output tests) do not have results within the tolerances of Table 1.

Compliance is confirmed for all of the relevant points above.

4.8 Test Results (Clause 10 of Schedule 10.7)

An ATH must, before it certifies a metering installation or any of a metering installation's metering components, review the relevant test results for each of the metering installation's metering components to ensure that the metering component passed all the tests and the metering installation meets the requirements for certification. Calibration and certification occurs at the same time for meters and data storage devices. All other component test results are reviewed prior to certification. Compliance is confirmed.

4.9 Selected Component Certification (Clause 11 of Schedule 10.7)

An ATH may use the selected component certification method to certify Category 1, 2 and 3 low voltage metering installations.

An ATH must only use the selected component certification method to certify a metering installation by carrying out the tests set out in Table 3 of Schedule 10.1 and if each of the following metering components in the metering installation has been calibrated in accordance with Schedule 10.8:

(i) Data storage device:

(ii) Meter:

(iii) Measuring transformer.

An ATH must, before it uses the selected component certification method:

- check the design report of the metering installation to confirm the metering installation functions in accordance with the design report and ensure the metering installation complies with this Part
- ensure that each metering component in the metering installation is used only in a permitted combination as set out in Table 1 of Schedule 10.1
- check and confirm that the metering installation is correctly wired in accordance with all applicable requirements and enactments
- ensure that each metering component in the metering installation is fit for purpose.

An ATH must, when it certifies a metering installation under this clause, ensure that the metering installation certification report includes confirmation that the ATH has:

- checked the design report of the metering installation to confirm the metering installation functions in accordance with the design report and complies with this Part

- ensured that each metering component in the metering installation has been calibrated and certified as required in this Part

- ensured that the metering installation has passed the relevant tests and checks set out in Table 3 of Schedule 10.1

- checked and confirmed that the metering installation is correctly wired in accordance with all applicable requirements and enactments

- carried out any tests and checks required to confirm the integrity of the metering installation and record these and their results in the metering installation certification report

- any compensation factors that must be applied and how the compensation factors must be applied under clause 2 of Schedule 15.3.

I checked the certification reports for 10 installations and I confirm compliance with all of the points listed above.

The matter of register advance testing for AMI metering was evaluated in detail following the previous audit. A memo was provided by the Authority to the industry on 17/06/14 and this included clarification regarding register advance testing. The requirement is as follows:

Register advance – a check that the register is actually advancing. For a mechanical register, the dial must actually move forwards, for a digital (LCD) register the lowest value place digit must increment up.

On 29/09/14, Metrix asked the Authority to consider a different method for confirming register advance. The main points of the different method are as follows:

- *When selecting a make and model of meter for deployment, Metrix conducts a series of fit-for purpose functional tests which includes:*

    - *Verification of how the registers and the pulse outputs are correlated; and*

    - *Verification that the Head End AMI System Register reading matches the meter register display,*

    - *Once this relationship is verified and understood, the information is then incorporated into Metrix Design Reports as part of the meter configuration;*

- *When shipments of new meters are received by Metrix, batch testing is completed using standard statistical sampling practices to verify the new stock conforms to expectations and confirms that the configuration conforms to those approved to be used on approved Design Reports. All meters are programmed with configurations that are extensively tested and verified in the Metrix Class A Approved Test House Laboratory before being deemed suitable for deployment into service. Part of this testing confirms that the meter register will advance in*

tandem with the meter pulsing. Therefore, neither the meter pulsing nor register advance can occur without the other.

- *Metrix meters are programmed to include an LCD display segment check as part of the standard display rotation. On installation commissioning, this check is designed to confirm that the display is operating correctly and has no faulty segments;*

- *Metrix meters are also programmed to have a visual indication of energy flow direction on the LCD display and a pulsing indicator (LED or LCD) indicating the rate of energy consumption. Standard pulse output rates of 250 or 1,000 pulses per kWh are used for Category 1 installations. On commissioning, the energy flow direction is verified*

- *When installation technicians are commissioning a meter installation using a Metrix meter, this visual energy consumption pulse setting and energy flow direction indicator enables the technician to measure the rate of energy consumption at relatively low current levels and verify that the meter is operating correctly without the need for the technician to wait on site for the register to increment by a whole or part kWh digit.*

Metrix is confident that on commissioning of a Metrix meter, the pulse and energy flow direction indication functions built into our meters are linked directly to the meter register. Neither the meter pulsing nor register advance can occur without the other; therefore, confirming that the meter is pulsing correctly on commissioning also confirms that the register is advancing and that the requirements of the Code [EIPC Schedule 10.7.11(5)(c)] have been met.

The Authority replied as follows:

"As you point out, in your letter, the register advance is required in table 3 of schedule 10.1; however the Code is not prescriptive on how this test should be carried out. It was intended to be an operational test that ensures that the device is functioning.

What I understand from your description is

a) All meters receive a configuration approved by Metrix Class A test house
b) Rate of flow indication is provided by visual pulses
c) All configurations include functionality that a register will advance in tandem with pulsing and pulsing cannot occur unless the register advances?
d) Class A ATH sample testing is carried out to ensure that compliance is achieved with c)
e) Commissioning tests on site include verification that the visual indication matches electricity flow through the meter.

This would seem to meet the Code requirement provided that the auditor had audited your process, and the tests were recorded in the metering records."

I have examined points a) to e) above and I have drawn the following conclusions:

Point a)
I confirm that all meter configurations programmed into meters have been approved by the Metrix Class A ATH.

Point b)

The pulse output is used as the rate of flow indication and it is recorded in the certification records that this test has been conducted.

Point c)

This is the most critical point in my opinion and I have included a diagram below which was provided by Metrix to confirm that the register (LCD) and the pulse output (Optical Port) both are driven from the Microcontroller.

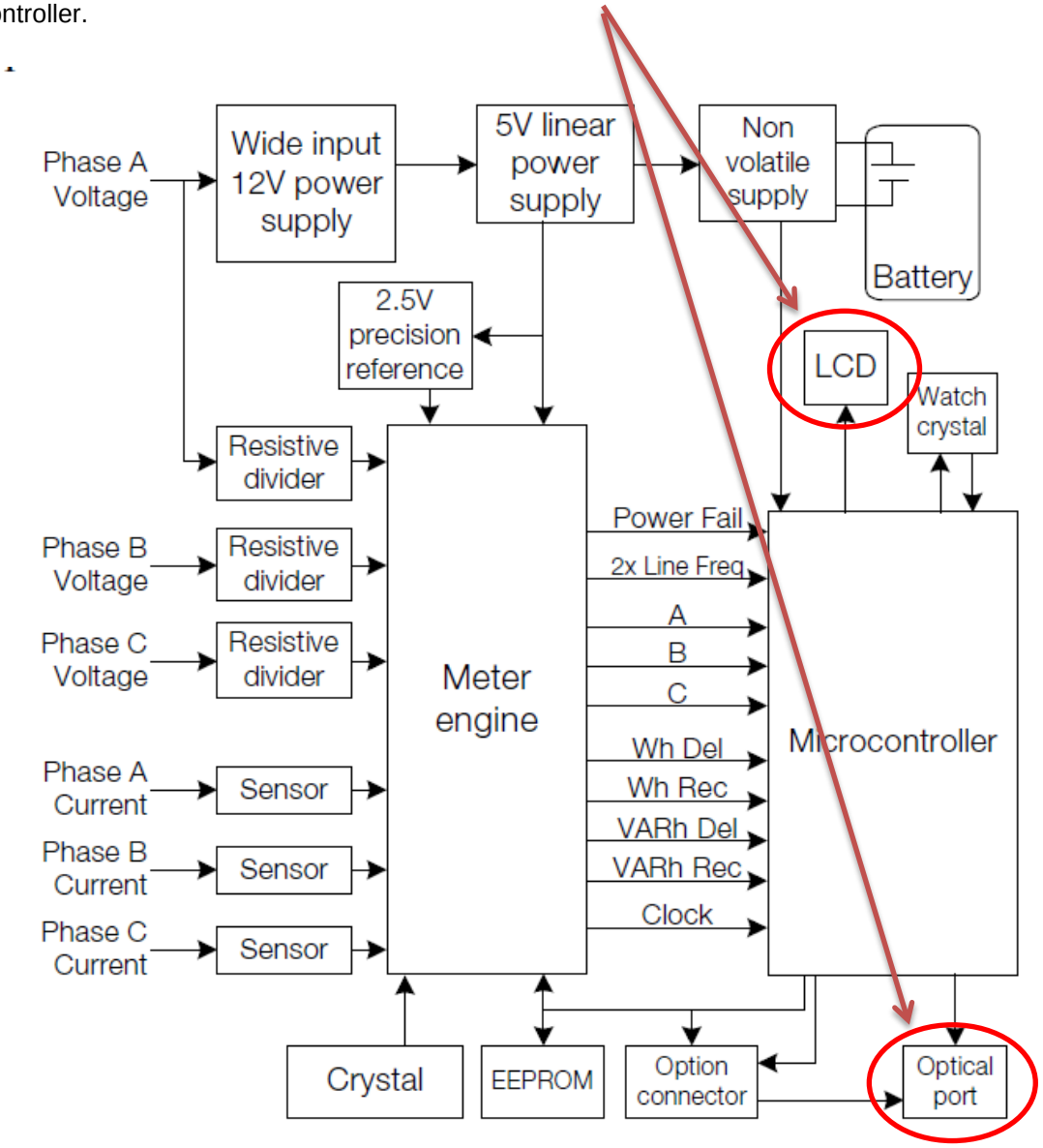


Figure 2-1. Wide voltage range meter circuit board block diagram

Point d)

Metrix conducts batch testing which includes the verification that the register advance matches the pulse outputs. Results were supplied as confirmation.

Point e)

Metrix requires that the on-site commissioning tests include confirmation that the pulse count matches the connected load.

In summary, I confirm that Metrix is conducting the tests and checks they stated in their letter to the Authority. The diagram above confirms that the pulse output and the register are both driven from the microcontroller. Compliance is confirmed.

4.10 Comparative Recertification (Clause 12 of Schedule 10.7)

An ATH may only use the comparative recertification method to recertify a category 2 metering installation in accordance with this Part if:

- the certification of the current transformers in the metering installation expires before the meter certification expiry date
- each data storage device and meter in the metering installation has been certified in accordance with Schedule 10.8.

An ATH must, when recertifying a category 2 metering installation under this clause, ensure that the metering installation has passed the tests set out in Table 3 of Schedule 10.1, using a working standard connected to the metering installation, and the current measurement sensor connected around the cables or bus-bars adjacent to the metering installation is sufficiently accurate so that the sum of the measured metering installation accuracy, the uncertainty of the metering installation, and the uncertainty of the current measurement sensor does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of the metering installation, and the overall metering installation accuracy meets the requirements of Table 1 of Schedule 10.1.

Metrix conducts comparative recertification tests using a working standard as required by this clause. Metrix has developed an uncertainty calculator, which includes working standard error and temperature based on the temperature coefficient of the working standards.

An ATH must, before it uses the comparative recertification method:

- check the design report of the metering installation to confirm the metering installation functions in accordance with the design report and ensure the metering installation complies with this Part
- check and confirm that the metering installation is correctly wired in accordance with all applicable requirements and enactments
- carry out any tests and checks required to confirm the integrity of the metering installation and record these and their results in the metering installation certification report.

Metrix conducts the checks above and records the results on the metering installation certification report, along with confirmation that the components are fit for purpose.

I checked the records for nine metering installations. Compliance is confirmed.

4.11 Fully Calibrated Installations (Clause 13 of Schedule 10.7)

An ATH must use the fully calibrated certification method to certify a metering installation by carrying out the tests set out in Table 4 of Schedule 10.1, and only if each of the following metering components in the metering installation has been certified in accordance with Schedule 10.8:
(i) data storage device
(ii) meter
(iii) measuring transformer.

An ATH must ensure that each metering component in a metering installation which is certified under this clause has a current certification report that complies with the requirements of this Part, and if the metering component is a calibrated metering component, includes a calibration report that confirms that the metering component complies with the requirements of its accuracy class set out in Table 1 of Schedule 10.1, and includes the certification date of the metering component.

An ATH must, when preparing a metering installation certification report under this clause, include confirmation that the ATH has:

a) checked the design report of the metering installation to confirm the metering installation functions in accordance with the design report, and ensure the metering installation complies with this Part

b) ensured that each metering component in the metering installation has been calibrated and certified as required in this Part

c) ensured that the relevant tests and checks set out in Table 4 of Schedule 10.1 have been passed

d) checked and confirmed that the metering installation is correctly wired in accordance with all applicable requirements and enactments

e) carried out any tests and checks required to confirm the integrity of the metering installation.

An ATH must, when it certifies a metering installation under this clause, include in the metering installation certification report any compensation factors that must be applied, and how the compensation factors must be applied under clause 2 of Schedule 15.3.

Metrix does not certify any installations using the fully calibrated method.

4.12 Insufficient Load (Clause 14 of Schedule 10.7)

This clause only applies if there is insufficient electricity conveyed through a point of connection to allow an ATH to complete a prevailing load test for a metering installation that is certified as HHR.
When this clause applies, the ATH must, when certifying the metering installation, ensure that it performs an additional integrity check of the metering installation wiring, and records the results of this check in the certification report; and it records in the certification report that the metering installation is certified under this clause.

A metering equipment provider must, for each metering installation for which it is responsible, and that is certified under this clause, obtain and monitor raw meter data from the metering installation at least once each calendar month during the period of certification to determine if load during the month is sufficient for a prevailing load test to be completed. The metering equipment provider must, if raw meter data obtained demonstrates, at any time, that there is sufficient electricity conveyed through the point of connection for a prevailing load test to be completed, ensure that the certifying ATH makes a subsequent visit to the metering installation as soon as practicable, but no later than 20 business days after the metering equipment provider has obtained the raw meter data, to carry out and complete the tests set out in Table 4 of Schedule 10.1.

The certifying ATH must, if the tests demonstrate that the metering installation performs within the relevant maximum permitted error set out in Table 1 of Schedule 10.1, update the metering installation certification report, within five business days of completing the tests, to include the results of the tests carried out; and leave the original metering installation certification expiry date unchanged.

If the tests demonstrate that the metering installation does not perform within the relevant maximum permitted error set out in Table 1 of Schedule 10.1, the metering installation certification is automatically cancelled from the date of the tests; and the certifying ATH must advise the metering equipment provider of the cancellation within one business day of carrying out the tests; and the metering equipment provider must follow the procedure set out in clauses 10.43 to 10.48.

There were no examples of installations having been certified under this clause. Metrix has provided an instruction and training with regard to this clause, requiring that load is added in all cases. Compliance is confirmed.

4.13 Statistical Sampling (Clause 16 of Schedule 10.7)

Metrix has conducted statistical sampling for meters. I checked the results, including the test points and I confirm compliance.

4.14 Certification Validity Periods (Clause 17 of Schedule 10.7)

An ATH must, when certifying a metering installation, determine, in accordance with this clause, the date on which the metering installation's certification will expire and record the expiry date in the metering installation certification report.

The expiry date for a metering installation's certification is the earliest of the date falling after the date of its commissioning by the number of months equivalent to the maximum metering installation certification validity period for the relevant category of metering installation, as set out in Table 1 of

Schedule 10.1 and the earliest certification expiry date of a metering component in the metering installation and a date determined by the ATH taking into account:

- the condition of each metering component in the metering installation
- all relevant circumstances relating to the metering installation.

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

The expiry date for each metering installation in a group of metering installations recertified under clause 16, which does not form a part of the sample, is the earliest expiry date of the metering installations in the sample. All expiry dates are calculated and recorded correctly. I checked the certification records for 20 installations and for installations certified by statistical sampling. Compliance is confirmed.

4.15 Modification of Metering Installations (Clause 19 of Schedule 10.7)

If a metering installation is modified, the certification of the metering installation is automatically cancelled. Metrix has a clear understanding that modification of metering installations requires recertification to occur. Many installations were modified and in all cases, re-certification occurred. Compliance is confirmed.

4.16 Metering Installation Accuracy (Clause 21 of Schedule 10.7)

An ATH must not certify a metering installation if the metering installation exceeds the maximum permitted error for the relevant metering installation category set out in Table 1 of Schedule 10.1, after the application of any external compensation factors.

The process documentation stipulates the maximum permitted errors for certification. I checked 10 certification records to confirm this was being applied correctly. Compliance is confirmed.

4.17 Error Calculation (Clause 22 of Schedule 10.7)

An ATH must, before it certifies a metering installation using the comparative or fully calibrated methods, calculate the error of the metering installation in accordance with the following:

- the ATH must calculate the percentage error of the metering installation using appropriate mathematical methods, taking account of all sources of measurement error and the estimated total quantity of electricity to be conveyed through the metering installation over the next 12 months
- the error calculation must include uncertainty in measurement
- the ATH must calculate uncertainty at a 95% level of confidence and in compliance with JCGM 100:2008.

The ATH must not certify the metering installation if the uncertainty for the metering installation is greater than the relevant maximum site uncertainty set out in Table 1 of Schedule 10.1 or if the sum of

the measured error and the uncertainty of the metering installation is greater than the relevant maximum permitted error set out in Table 1 of Schedule 10.1.

The ATH must record the calculation in the metering installation certification report.

As recorded in Section 4.10, Metrix is calculating the uncertainty per installation and is considering all site specific conditions, for example temperature. Compliance is confirmed.

4.18 Compensation Factors (Clause 8 of Schedule 10.4 & 24 of Schedule 10.7)

An ATH must, if it is approved to certify metering installations, have a documented process for determining compensation factors. Metrix has a documented process for the management of compensation factors (multipliers), although they are normally programmed into the meter. The testing procedures provide confirmation of the multiplier and CT ratio, the multiplier is recorded on the metering installation certification report. I checked the certification records for 10 metering installations and I confirm compliance.

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

An ATH must, before it certifies a metering installation, ensure that installation of measuring transformers, and associated burden if required, test facilities, potential fuses, and switchboard wiring, was carried out by a suitably qualified person (for example by a switchboard manufacturer), or an ATH and each metering component in the metering installation, other than a metering component referred to above, is carried out by an ATH.

An ATH must, before it certifies a metering installation, ensure that each metering component in the metering installation has been installed in accordance with the design report.

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. Metrix has a documented process to ensure compliance with this clause. I checked the register of CTs issued and I confirm meters are not provided and I confirm there is monitoring of CTs issued to ensure they are installed within a reasonable time. Compliance is confirmed.

4.19.1 Meter Requirements (Clause 26 of Schedule 10.7)

An ATH must, before it certifies a metering installation incorporating a meter, if the meter had previously been used in another metering installation, ensure that the meter has been recalibrated since it was removed from the previous metering installation, by an approved calibration laboratory or an ATH. Metrix complies with this clause and they don't re-use meters without them being recalibrated and recertified.

The ATH must, before it certifies a metering installation incorporating a meter, document in the metering records any regular maintenance required for the meter in accordance with the manufacturer's recommendations and any maintenance that has been carried out on the meter (for example battery monitoring and replacement).

Metrix has not certified any installations where the meter requires maintenance and they have not conducted any maintenance on any components. As a Class B field ATH, Metrix 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.

An ATH must, before it certifies a metering installation incorporating a meter, record in the metering installation certification report, the maximum interrogation cycle for the metering installation. I checked 20 certification reports to confirm the maximum interrogation cycle is recorded. Compliance is confirmed.

4.19.2 Meter Certification Expiry Date (Clause 27 of Schedule 10.7)

An ATH must, before it certifies a metering installation incorporating a meter, determine the meter certification expiry date for each meter in the metering installation in accordance with this clause.

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:

- the maximum metering installation certification validity period set out in Table 1 of Schedule 10.1 for the relevant category of metering installation; or
- 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
- the certification period specified in the meter certification report.

The meter certification expiry date for a meter that has been certified and subsequently installed in, and removed from, a category 1 metering installation, remains the meter certification expiry date determined for that meter when it was installed in the category 1 metering installation.

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.

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.

Metrix demonstrated compliance with all of the points listed above. I checked the records for 20 installations which confirmed compliance.

4.19.3 Measuring Transformer Requirements (Clause 28 of Schedule 10.7)

An ATH must, before it certifies a metering installation which includes a measuring transformer that had previously been used in another metering installation, ensure that the measuring transformer has been recalibrated, since it was removed from the previous metering installation, by an approved calibration laboratory or an ATH.

The ATH must, before it certifies a metering installation incorporating a measuring transformer, document in the metering records any regular maintenance required for the measuring transformer in accordance with the manufacturer's recommendations and any maintenance that has been carried out on the measuring transformer.

An ATH must, before it certifies a metering installation incorporating a measuring transformer, ensure that the measuring transformer is fitted with a test facility and provision for isolation, which must be installed as physically close to the meter as practical in the circumstances and ensure the test facility has a transparent cover that is not obscured.

I checked the photos 10 Category 2 metering installations and I confirm compliance with the points noted above.

Other relevant requirements of this clause for Metrix are that they must:

- ensure that the measuring transformer is mounted securely and if practicable, in an enclosure that is sealed in accordance with clause 47 against unauthorised access
- ensure that all fuses and circuit breakers are sealed or located in sealed enclosures
- ensure that, if an enclosure also contains fuses or circuit breakers supplying other circuits, those supplying metering circuits are individually sealed
- ensure that if the measuring transformer's secondary circuit in the metering installation is earthed, it is earthed at no more than one point
- ensure that the total burden (magnitude and phase angle, where appropriate) 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.

I checked the photos for 10 Category 2 metering installations and I confirm compliance with the points noted above. Burden is measured for each metering installation and certification will not occur if the maximum rating is exceeded. Compliance is confirmed.

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

An ATH must, before it certifies a metering installation incorporating a measuring transformer, determine the measuring transformer certification expiry date for each measuring transformer in the metering installation in accordance with this clause.

The measuring transformer certification expiry date must be no later than the last day of the measuring transformer certification validity period specified in the measuring transformer certification report, after the date of commissioning.

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

The metering installation certification report contains a field for CT expiry date and a check of 10 records confirmed this was being calculated and used correctly. Compliance is confirmed.

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

An ATH must, before it certifies a metering installation incorporating a measuring transformer used by other equipment, ensure that the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation category set out in Table 1 of Schedule 10.1.

There were no examples to examine where other equipment was connected to measuring transformers. However the measurement of burden during commissioning will address this matter. Compliance is confirmed.

4.19.6 Burden & Compensation (Clause 31 of Schedule 10.7)

An ATH must, before it may add or change any burden or compensation factor detailed in the design report, obtain the approval of the metering equipment provider responsible for the metering installation. Metrix is the MEP and the ATH so the approval issue will not arise. Metrix will always recertify installations if there is a change to burden or compensation factors.

The issue of the low burden for CTs has been clarified by the Authority through a memo, which confirms that ATHs are required to take certain actions if the in-service burden is less than the lowest test point used when the CT was calibrated. The actions are to install burden resistors or confirm with a Class A ATH or the manufacturer that the CTs will continue to operate accurately at low burden. Most new CTs are manufactured and certified by TWS. TWS has conducted testing and confirmed that CTs with ratios of 500/5 or greater will not be affected by low burden. Those under 500/5 may be affected by low burden. Metrix is only purchasing CTs with ratios of 500/5 or greater.

Metrix confirms the in-service burden during certification and re-certification, but they are not installing burden resistors where the in-service burden is less than 25%. An example is ICP 0216378001LC287 where ATCO multi ratio CTs are installed on the 600/5 tap. The rated VA is 15 and the in-service burden is approx. 0.9VA. I checked a further four ICPs where the 300/5 tap was used (with a 10VA

rating) and the in-service burden ranged from 0.5 to 1.4. In all cases, the total installation error was within the allowable threshold but Metrix has not confirmed that these CTs will operate accurately with this in-service burden. The matter of low CT burden is rated as a medium risk because CT metered installations could be recording inaccurately and this could lead to inaccurate submission information. The level of control is moderate because Metrix has conducted some informal testing to determine the impact of low burden, which indicates some CTs may operate outside their class at the 300/5 and 150/5 ratios.

<table>
<tr><td>Non-compliance</td><td colspan="3">Description</td></tr>
<tr><td>With: Clause 20(1)(b) of schedule 10.7

From/to: Entire audit period</td><td colspan="3">Metrix has not confirmed the accuracy of non-TWS CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard.
Risk Rating: Medium
Adequacy of Controls: Moderate
Audit history: None
Procedures: Need improvement</td></tr>
<tr><td colspan="2">Actions taken to resolve the issue</td><td>Completion date</td><td>Remedial action Status</td></tr>
<tr><td colspan="2">Metrix understanding is that burden needs to be applied when an individual component is being certified (EIPC Schedule Part 10, Schedule 10.7, Clause 31, (7)). The comparative method of certification does not certify the component. Metrix ATH is confident that sufficient testing is carried out to ensure that installations are classed as within the applicable accuracy tolerances set out in Table 1 of Schedule 10.1, IE they meet the requirements of EIPC Schedule Part 10, Schedule 10.7, Clause 20, 1,(b).</td><td></td><td rowspan="3">Metrix has provided detailed comments disputing the non-compliance, with reference to the overall accuracy tolerances of Table 1</td></tr>
<tr><td colspan="2">Preventative actions taken to ensure no further issues will occur</td><td>Completion date</td></tr>
<tr><td colspan="2"></td><td></td></tr>
</table>

4.19.7 Data Storage Devices (Clauses 36 & 38 of Schedule 10.7)

An ATH must, before it certifies a metering installation incorporating a data storage device that had previously been used in another metering installation, ensure that the data storage device has been recalibrated since it was removed from the previous metering installation, by an approved calibration laboratory or an approved test laboratory or an ATH. The policy is that all metering components will be re-calibrated before being re-used.

An ATH must, before it certifies a metering installation incorporating a data storage device, record in the metering installation certification report, the maximum interrogation cycle for the metering installation. The maximum interrogation cycle is recorded in all certification reports.

An ATH must, before it certifies a metering installation with a data storage device, ensure that each data storage device in the metering installation:

a) is installed so that on site interrogation is possible without the need to interfere with seals

b) is compatible with each other metering component of the metering installation

c) is suitable for the electrical and environmental site conditions in which it is installed

d) has been certified under Schedule 10.8

e) has all of its outputs and inputs appropriately electrically isolated and rated for purpose

f) has no outputs that will interfere with the operation of the metering installation

g) records periods of data identifiable or deducible by both date and time on interrogation

h) 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

i) 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 for a minimum continuous period of 15 days.

The points above, apart from point "d" are documented in the type test report, which is checked as part of the certification process for the data storage device. Metrix is ensuring data storage devices are certified and the maximum interrogation cycle is recorded. Compliance is confirmed.

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

An ATH must, before it certifies a metering installation incorporating a data storage device, determine, in accordance with this clause, the data storage device certification expiry date for each data storage device contained in the metering installation and record the expiry date in the metering installation certification report. I checked 20 records and confirm compliance with this clause.

4.20 Certification Stickers (Clause 41 of Schedule 10.7)

An ATH must, if it has certified a metering installation under this Part, confirm the certification by attaching a metering installation certification sticker as physically close as practicable to (including, if practicable, on) the meter while maintaining reasonable visibility of the certification sticker and the meter.

An ATH attaching a metering installation certification sticker must ensure that it shows:

- the name of the ATH who certified the metering installation
- the most recent certification date of the metering installation
- the metering installation category for which the metering installation has been certified
- the ICP identifier for the metering installation
- the certification number for the metering installation
- any other information that the Authority may, from time to time, notify giving reasonable notice.

An ATH must, when certifying a metering installation that includes a metering component that does not have a certification sticker attached:

- obtain the metering component certification sticker required under clause 8 of Schedule 10.8
- attach it next to the metering installation certification sticker.

Metrix applies certification stickers with all of the relevant fields. The photo below confirms compliance.

4.21 Metering Component Stickers (Clause 8 of Schedule 10.8)

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

An ATH must ensure that a metering component certification sticker shows:

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

An ATH must ensure that a certification sticker is:

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

Metrix certifies meters, data storage devices and some control devices. I checked an example of each type of component and they all had appropriate certification stickers. Compliance is confirmed.

4.22 Enclosures (Clause 42 of Schedule 10.7)

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.

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

The photos for 10 metering installations showed that all enclosures were appropriate for the environment. Metrix has a separate warning sticker for CT chambers, which is shown in the photo below. Compliance is confirmed.

4.23 Wiring (Clause 6 of Schedule 10.8)

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
- compliant with all applicable requirements and enactments.

Compliance with this requirement is included in the section of the manual discussed in Section 4.22.

An ATH must, before it certifies a metering installation, ensure that the wiring between metering components in the metering installation:

- is run as directly as practicable
- is appropriately sized and protected
- does not, to the extent practicable, include intermediate joints for any measuring transformer circuits

- includes conductors that are clearly and permanently identified, by the use of any one or more of the following:

    - colour coding:
    - marker ferrules:
    - conductor numbering.

I confirmed compliance with this by checking design reports, procedure documentation and photos for 10 recently certified installations.

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

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.

The process documentation and design reports include compliance with this requirement. I checked the photos of five recently certified installations which confirm compliance.

4.25 Control Devices

4.25.1 Installations Incorporating Control Devices (Clause 33 of Schedule 10.7)

Reconciliation Participants are responsible for advising the MEP if a control device needs to be certified.

An ATH must, before it certifies a metering installation incorporating a control device:

- determine the control device certification expiry date for each control device contained in the metering installation as being the same as the metering installation certification expiry date
- record the expiry date, for each control device, in the metering installation certification report.

If the metering installation contains a control device that had previously been used in another metering installation, the ATH must ensure that the control device has been certified in accordance with Schedule 10.8 after it was removed from the other metering installation.

The ATH must ensure that the metering installation certification report includes confirmation that:

- the control device complies with any applicable standards listed in Table 5 of Schedule 10.1
- the control device is fit for purpose.

The ATH must check that the control device is:

- likely to receive control signals, as required under clause 34
- correctly connected

- correctly programmed.

Metrix is certifying control devices and recording the appropriate information in certification records. Compliance is confirmed.

4.25.2 Control Device Reliability (Clause 34 of Schedule 10.7)

An ATH must, before it certifies a metering installation incorporating a control device determine, in consultation with the relevant distributor if appropriate, if the likelihood of the control device not receiving control signals would affect the accuracy or completeness of the information for the purposes of Part 15.

After the last audit, Metrix corresponded with distributors to determine if there were any areas with signal propagation issues. Vector responded that there was a problem with the pilot system in the northern region but there were no other issues identified. Compliance is achieved.

5. Alternative Certification (Clause 32 of Schedule 10.7)

An ATH may, if it cannot comply with the requirements of clause 2 of Schedule 10.8 due solely to its inability to obtain physical access to test an installed measuring transformer in a metering installation, certify the metering installation for a period not exceeding 24 months, if:

- the measuring transformer has not previously been certified under this clause
- the ATH is satisfied, having made due enquiry, that the metering installation will comply with the applicable accuracy requirements as set out in Table 1 of Schedule 10.1
- the ATH has advised the metering equipment provider responsible for the metering installation that this clause applies
- the metering equipment provider has advised the registry of the certification under this clause.

The metering equipment provider must, by no later than 10 business days after the date of certification of the metering installation, advise the market administrator in the prescribed form of:

- all relevant details of the metering installation
- the reason or reasons why the ATH could not obtain physical access to the measuring transformer
- the reason or reasons why the accuracy of the metering installation cannot be outside of the applicable accuracy requirements set out in Table 1 of Schedule 10.1
- the metering installation certification expiry date
- respond, within five business days, to any requests from the market administrator for additional information
- ensure that all of the details are recorded in the metering installation certification report.

If the market administrator subsequently determines that the ATH could have obtained physical access to test an installed measuring transformer in the metering installation, the metering installation is deemed to be defective and the metering equipment provider responsible for the metering installation must comply with clauses 10.43 to 10.48. Metrix has not applied alternative certification in accordance with this clause.

6. Inspections

6.1 General Inspection Requirements (Clause 44 of Schedule 10.7)

An ATH must, when carrying out an inspection of a metering installation, conduct the following checks:

- check and confirm that the data storage device in the metering installation operates in accordance with the requirements of this Part
- 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 under clause 19 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 in accordance with clause 41
- in the case of a category 1 metering installation incorporating a data storage device, 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.

An ATH must, for each inspection of a metering installation that it carries out, prepare an inspection report that details:

a) the checks that were carried out

b) the results of the checks

c) the metering installation certification expiry date

d) the serial numbers of each metering component in the metering installation

e) any instances of non-compliance with this Part, and the actions taken to remedy such a breach

f) the name and signature of the person who carried out the inspection and the date on which it was signed.

The ATH must, within 10 business days of carrying out the inspection, provide the inspection report to the metering equipment provider who is responsible for the metering installation. Metrix has conducted statistical inspections for Category 1 metering installations where Metrix is the MEP. The process and the documentation is compliant. Metrix has not yet inspected any installations with data storage devices; however I recommend a process is developed for this, where the MEP is requested to provide the most recent sum-check results, clock synchronisation report and event report. This information can be used to determine whether the data storage device is operating correctly.

Recommendation	Description	Audited party comment	Remedial action
Regarding: Clause 44 of schedule 10.7	Develop a process for inspecting Category 1 installations with data storage devices.	Metrix agrees that a new process should be developed for inspecting HHR installations which incorporate a data storage device	Identified

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

An ATH must, when conducting an inspection of a category 2 metering installation, or higher category of metering installation, and in addition to complying with clause 44, conduct the following checks:

a) a visual inspection of each metering component in the metering installation for damage, tampering, or defect

b) 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

c) check for the presence of appropriate voltages at the metering installation

d) check the voltage circuit alarms and fault indicators.

Metrix has not conducted any inspections for higher category installations.

7. Sealing

7.1 Sealing Requirements (Clause 47 of Schedule 10.7)

An ATH must, before it certifies a metering installation, ensure that each metering component in the metering installation that could reasonably be expected to affect the accuracy or reliability of the metering installation is sealed.

An ATH must, before leaving a metering installation unattended, ensure that each part and connection of a data storage device that is contained in, or attached to, the metering installation is sealed.

An ATH must, before it certifies a metering installation, ensure that the main switch cover is sealed if the main switch is on the supply side of the metering installation and has provision for sealing.

An ATH must, when applying a seal to a metering component in an enclosure, attach a label in a prominent position inside the enclosure, warning of the presence of a sealed metering component in the enclosure and that care must be taken not to disturb the connections to the metering component.

An ATH must use a sealing system that enables the following information to be determined:

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

The process documentation achieves compliance with all of the requirements above. I checked the photos for 20 Category 1 and Category 2 metering installations and I confirm that all components and enclosures were appropriately sealed. Main switches are sealed where this is possible. The certification sticker contains an appropriate warning label. The date of application of seals is recorded in the metering installation certification records. Compliance is confirmed.

7.2 Removal or Breakage of Seals (Clause 48 of Schedule 10.7)

An ATH must, when investigating an unauthorised removal or breakage, assess the accuracy and continued integrity of the metering installation and if, in its opinion, the accuracy and continued integrity is unaffected, replace the removed or broken seals, or if, in its opinion, the accuracy and continued integrity is affected, replace the removed or broken seal and advise the metering equipment provider under clause 10.43.

Metrix has appropriate instructions in relation to this requirement and there is the ability to record this information on the commissioning record for the installation. I checked one example which confirmed compliance.

8. Metering Component Requirements

8.1 Metering Component Certification (Clause 42 of Schedule 10.7)

An ATH must, before it certifies a metering installation, ensure that each metering component that is required to be certified under this Part and which is in the metering installation:

- is certified by an ATH in accordance with this Part
- since certification, has been appropriately stored and not used.

Metrix conducts certification of components in their laboratory and they have appropriate arrangements for storage and transportation.

An ATH may certify a category 1 metering installation that contains a meter which has been certified and subsequently installed in, and removed from, another category 1 metering installation, in which case, the ATH must:

- be satisfied that external factors have not affected the accuracy of the meter

- check and confirm in the certification report for the metering installation that the date on which the meter was previously installed in the other metering installation is less than 12 months before the commissioning date of the metering installation that the ATH is certifying.

This clause is designed to allow builder's temporary supplies to be portable without the need to calibrate the meter every time. Metrix understands the requirements of this clause and has appropriate processes in place to correctly determine expiry dates. Metrix policy is that all components are re-calibrated and re-certified once they have been removed. Compliance is confirmed.

8.2 Meter Certification (Clause 1 of Schedule 10.8)

An ATH must, before it certifies a meter, ensure that:

- an approved test laboratory has:
    - conducted type-testing that the ATH considers appropriate for the model and version of meter
    - produced a type-test certificate that:
        - confirms the meter's technical characteristics
        - confirms the range of environmental conditions within which the meter has been proven accurate and reliable
        - confirms that the meter performs the functions for which it was designed
        - confirms that the meter complies with the requirements of this Part
        - records the tests undertaken by the approved test laboratory and the reasons why the ATH considers that they are appropriate

- the meter has a current calibration report

- the meter calibration report:
    - confirms that the meter complies with the standards listed in Table 5 of Schedule 10.1
    - records the tests the ATH has performed to confirm compliance and the results of those tests
    - confirms that the meter has passed the tests
    - records any recommendations on error compensation
    - includes any manufacturer's calibration test reports

- it produces a meter certification report that includes:
    - the date on which it certified the meter
    - the certification validity period for the meter for each category of metering installation that the meter may be used in
    - the maintenance requirements for the meter
    - the meter calibration report
    - 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 percentage values of current set out in Table 6 or Table 7 of Schedule 10.1, as applicable, are relative to the meter's base or rated current (Ib or In) as appropriate, and this current is selected at a level appropriate for the metering installation in which the meter is to be installed.

The certification validity period must not be greater than the maximum certification validity period set out in Table 2 of Schedule 10.1 for the relevant class of meter. I checked 20 meter certification reports and confirm that all of the information mentioned above is included. Metrix has a schedule with all relevant meter types and whether the type test reports have been reviewed and approved. Compliance is confirmed.

8.3 Measuring Transformer Certification (Clauses 2 & 3 of Schedule 10.8)

An ATH must, before it certifies a measuring transformer:

- ensure, by testing, that a current calibration report sets out the measuring transformer's errors at a range of primary values at their rated burdens

- that is a multi-tap current transformer, carry out the calibration tests and only certify the transformer for the ratios that have been calibrated if the test is passed

- obtain confirmation of accuracies from the measuring transformer's manufacturer if the rated burden is lower than a test point specified in a standard listed in Table 5 of Schedule 10.1

- determine the measuring transformer certification validity period.

An ATH must, before it certifies an epoxy insulated current transformer, ensure that the certification tests allow for and the metering installation certification report shows, the current transformer's age, temperature, and batch. Epoxy insulated CTs are discarded upon discovery.

An ATH must, before it certifies a measuring transformer, ensure that:

- the measuring transformer has a current calibration report

- the measuring transformer calibration report:

    - confirms that the measuring transformer complies with the standards listed in Table 5 of Schedule 10.1
    - records the tests the ATH has performed to confirm compliance and the results of those tests
    - 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

- it produces 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
- the measuring transformer calibration report
- 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

- confirmation that it 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 of this Part.

Most CTs are purchased pre-certified by TWS. Those that are certified by Metrix are done so in accordance with these clauses. Compliance is confirmed.

8.4 Control Device Certification (Clause 4 of Schedule 10.8)

An ATH must, before it certifies a new control device, 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
- confirms that the control device has passed such tests.

An ATH must, before it certifies an existing installed control device, produce a certification report that:

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

Metrix certifies control devices in accordance with these clauses. The certification report is combined with the metering installation certification report. Compliance is confirmed.

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

An ATH must, before it certifies a data storage device used for storing information that is used for the purposes of Part 15, ensure that:

- an approved test laboratory has:
    - conducted type-testing that the ATH considers appropriate for the model and version of data storage device
    - produced a type-test certificate that:
        - confirms the data storage device's technical characteristics
        - confirms the range of environmental conditions within which the data storage device has been proven accurate and reliable

        - confirms that the data storage device performs the functions for which it was designed
        - confirms that the data storage device complies with this Part
        - records the tests undertaken by the approved test laboratory to confirm compliance and the reasons why the ATH considers that they are appropriate

- it produces a certification report that:

    - confirms the data storage device complies with the applicable standards listed in Table 5 of Schedule 10.1
    - records the tests the ATH has performed to confirm compliance with subparagraph (i) and the results of those tests
    - confirms that the data storage device has passed the tests
    - includes the date on which it certified the data storage device
    - includes the certification validity period for the data storage device for each category of metering installation in which the data storage device may be used
    - records the maintenance requirements for the data storage device
    - confirms that each period of data is identifiable or deducible by both date and time on interrogation
    - confirms that the time and date of the following event conditions are recorded in an event log:
        - a loss of the power supply to the data storage device
        - critical internal alarms such as memory integrity checking, battery low, battery failed, and tampering
        - phase failure to the meter, if the data storage device is integral to the meter
        - any software configuration changes
        - results of time setting comparisons and corrections
        - the transition from, and to, New Zealand daylight time, if the data storage device operates in New Zealand daylight time
    - confirms that the data storage device has the available memory capacity required by the type test
    - confirms that the data storage device has the functionality:
        - to validate instructions from an interrogation system
        - for time comparisons and corrections, in response to a valid instruction
    - confirms that all information logged is referenced to New Zealand Standard Time or New Zealand daylight time
    - confirms 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.

The data storage device certification validity period must be:

- no more than 180 months, if the data storage device is a discrete metering component

- the same as the meter certification validity period, if the data storage device is integral to the meter.

The memory capacity of the data storage device must not be less than 15 days.

I checked 10 certification reports and confirm that all of the information mentioned above is included. Compliance is confirmed.

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

A certifying ATH may only calibrate a metering component on site in the metering component's normal working environment and by measuring the influence of all on site variables, including their estimated effects in the uncertainty calculation and ensuring that the effects of any departures from the reference conditions specified in the relevant standards listed in Table 5 of Schedule 10.1 can accurately and reliably be calculated and 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.

If an 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 and 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.

An ATH who certifies a metering component on site must include in the metering component certification report confirmation 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 and the calculation of the uncertainty comprises all uncertainties in the chain of calibration and 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 onsite calibration and includes the methodologies, calculations, and assumptions used by the ATH in determining the uncertainty and the ATH believes the methodologies, calculations, and assumptions are appropriate, including reasons for that belief.

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

9. Record Keeping

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

An ATH must ensure it documents and maintains a record system for all records, certificates, and reports for any activity regulated under this Part.

An ATH must ensure that:

- all its records, certificates, and reports are stored securely
- each of its test records for a metering installation is identified by a unique identifier

- all of its records, certificates, and reports are sufficiently detailed to enable verification of all aspects of all tests it carries out, including the following:
    - test conditions
    - specific test equipment used
    - personnel carrying out the tests.

I checked the records for 20 installations and confirm compliance with all of the requirements above.

9.2 Retention of Records (Clause 13 of Schedule 10.4)

An ATH must, for each activity regulated under this Part in relation to a metering installation and metering component that it certifies and a metering component that it calibrates, retain, for at least 48 months after the date of decommissioning the metering installation or removal of a metering component, all of its records, certificates, and reports and all certification reports produced by the ATH

Metrix intends to keep records for 48 months and they confirm they have kept all records since the ATH commenced certification activities. Compliance is confirmed.

10. Conclusions

This audit found a high level of compliance. All of the issues from the previous audit have been resolved, and this audit identified two new non-compliance issues and three recommendations are made.

Metrix has not kept up momentum with their subcontractor audit regime and there are currently no field audits being conducted. I've rated this as a medium potential risk as there are only a small number of contractors engaged by the Metrix ATH and they have performed well in the past. The level of control is rated as moderate rather than weak because there are reviews performed of Category 2 certification reports.

The matter of low CT burden is also rated as a medium risk because CT metered installations could be recording inaccurately and this could lead to inaccurate submission information. The level of control is moderate because Metrix has conducted some informal testing to determine the impact of low burden.

The matters found are shown in the tables below:

Table of Non Compliance

Subject	Section	Clause	Non compliance	Risk rating	Control rating	Risk score	Audit History	Procedures	Remedial action
Use of contractors	3.1	10.3(1) of part 10	Subcontractor management practices do not ensure all contractors have the required skill and expertise in accordance with the Code.	Medium	Moderate	4	None	Need improvement	Identified
CT burden	4.19.6	20(1)(b) of schedule 10.7	Metrix has not confirmed the accuracy of non-TWS CTs when the in-service burden is lower than the lowest test point recorded in the IEC standard.	Medium	Moderate	4	None	Need improvement	Disputed

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Remedial Action
Use of contractors	3.1	10.4(1) of part 10	Prepare a summary table showing all contractors and their training and competence status.	Identified
ATH requirements	3.5	10.41 of part 10	Include PPE use and management in field audits.	Identified
Inspections	6.1	44 of schedule 10.7	Develop a process for inspecting Category 1 installations with data storage devices.	Identified

11. Audit Date Recommendation

Clause 1(4)(c) of Schedule 10.3, requires the Authority to specify the date of the next schedule audit when they issue a certificate of approval. The Authority has provided a guideline for the calculation of the next audit date, which is shown below. The total risk score is 8, which results in a recommendation for an audit within 18 months.

Breach risk ratings

		Adequacy of control		
		Weak	Moderate	Strong
Audit Risk Rating	High	9	6	3
	Medium	6	4	2
	Low	3	2	1

Table 1: Indicative audit frequency

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

12. Signatures

Signed By:

Steve Woods – Veritek Limited
Electricity Authority Approved Auditor

Signed By:

13. Audit Summary for Electricity Authority Website

As per clause 9 of schedule 10.2 of the Electricity Industry Participation Code, the Authority is required to publish a summary of each audit report.

Date of audit report:	08/05/17
Participant involved:	Metrix
Auditor involved:	Steve Woods – Veritek Limited
Scope of the audit:	Clause 3(2) of Schedule 10.3 (Class A) - Functions requiring approval: (a) calibration of— (i) working standards: (ii) metering components (other than a calibration referred to in paragraph (c)): (h) inspection of metering installations. Clause 4(2) of Schedule 10.3 (Class B) - Functions requiring approval: (b) installation and modification of metering installations: (c) installation and modification of metering components: (d) calibration of metering components on site: (e) certification, using the selected component certification method, of: (i) category 1 metering installations: (ii) category 2 metering installations: (iii) category 3 metering installations with a primary voltage of less than 1kV: (g) certification, using the comparative recertification method, of category 2 metering installations: (h) issuing of certification reports in respect of certifications of metering installations under paragraphs (e) to (g): (i) inspection of: (i) category 1 metering installations: (ii) category 2 metering installations: (iii) category 3 metering installations with a primary voltage of less than 1kV.
Outcome of the audit:	Not compliant

14. Metrix Response