Electricity Industry Participation Code Audit Report

For

NZBN: 9429038690815

Class B Approved Test House

Prepared by Steve Woods – Veritek Limited

Date of Audit: 13/04/22

Date Audit Report Complete: 12/05/22

Date Audit Report Due: 13/05/22

Executive Summary

Wells is a Class B Approved Test House and is required to undergo an audit by 13 May 2022, in accordance with clause 16A.19(b).

The audit was conducted in accordance with the ATH Audit Guidelines V1.3 produced by the Electricity Authority.

The audit report records 16 non-compliances and makes nine recommendations for improvement.

Several of the non-compliances from the last audit have been resolved, mainly related to the accuracy of fields in certification reports, but there are still a number of non-compliant field processes, and the accuracy and readability of certification reports still requires attention.

The main issues are as follows:

1. 18 of 20 Category 2 certification reports had the selected component certification method recorded instead of the comparative method. Many of these had measuring transformers recorded as certified but calibration tests were not conducted.

2. The 18 installations above have CT certification stickers even though the CTs are not certified. These stickers will need to be removed.

3. It's likely a further 306 selected component certifications are actually comparative.

4. At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs.

5. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class.

One of the main recommendations I have made is that validation is improved to ensure the issues raised in this report are identified and resolved as soon as possible. It also appears that improvements may be required in the training and competency area to minimise non-compliant field practices.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The Future Risk Rating table provides some guidance on this matter and recommends a next audit frequency of three months. I've balanced two issues with my recommendation for the next audit date, firstly the need to have the issues resolved and re-audited as soon as possible and the need to ensure there is sufficient time to make the improvements. I believe three months is insufficient time and I therefore recommend a next audit period of six months.

The matters found are shown in the tables below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Accurate information	2.2	10.6 of Part 10	18 of 20 Category 2 certification reports had the selected component certification method recorded instead of the comparative method. Many of these had measuring transformers recorded as certified but calibration tests were not conducted. The 18 installations above have CT certification stickers even though the CTs are not certified. These stickers will need to be removed. It's likely a further 306 selected component certifications are actually comparative. Four Category 2 certification reports had the incorrect burden range recorded or did not have the burden range recorded. Seven Category 2 certification reports had the installation type recorded as NHH, but they were actually HHR. The "SET DEFAULT ANSWERS" section of certification reports is misleading.	Moderate	Low	2	Identified
Metering Installation Type	3.2	8(2) of Schedule 10.7	Seven Category 2 certification reports record the installation type as NHH instead of HHR.	Strong	Low	1	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Certification at a Lower Category	3.10	6(4) Of Schedule 10.7	All information regarding lower category certification not included in the certification reports for four metering installations.	Moderate	Low	2	Identified
Compliance with part 10	5.1	8(1) Of Schedule 10.7	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class.	Moderate	High	6	Identified
Certification as a lower category	5.7	6(2)(b) & (d) of Schedule 10.7	Wells does not have sufficient information to determine certification as a lower category is appropriate. Including for ICP 0000164833CK11A which was a new connection, where historic data from a similar installation may be required to confirm the load or consumption will not exceed the thresholds.	Moderate	Low	2	Identified
Certification tests	5.12	9(1) of Schedule 10.7	Minimum load of 5% was not applied for ICP 0000511359WE36F. At least 10 Category 1 metering installations recertified without a prevailing load test.	Strong	Low	1	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Test results	5.16	10(1)&(2) of Schedule 10.7	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class.	Moderate	High	6	Identified
Selected component certification	5.18	11(4) of Schedule 10.7	Calibration not conducted when CTs certified for up to 324 Category 2 metering installations certified using the selected component method. ICPs 0007196846RNC92 and 0007190809RN429 had meters recertified without calibration being conducted. Meters certified without calibration for at least 10 Category 1 installations recertified with existing meters.	Moderate	Low	2	Identified
Compensation Factors	5.31	24(1)(b) of Schedule 10.7	Incorrect compensation factor recorded for ICP 0000616050WPE6E.	Moderate	Low	2	Identified
Measuring Transformers used in a Certified Metering Installation	5.37	28(4) Of Schedule 10.7	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs.	Moderate	High	6	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Low burden	5.40	31 Of Schedule 10.7	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Three ICPs with burden higher than the rated burden.	Moderate	High	6	Identified
Certification stickers	5.46	41(1) and 41(9) of Schedule 10.7	Old certification sticker not removed for one installation.	Moderate	Low	2	Identified
Requirement for Calibration of Metering Components	5.59	7(2) Of Schedule 10.4	Up to 324 sets of CTs certified without calibration.	Moderate	Low	2	Identified
Meter Certification	5.64	1 of Schedule 10.8	Meter number 208137248 at ICP 0006475345RN7AB was recorded as recertified but it does not have a calibration report and is therefore not certified.	Moderate	Low	2	Identified
Measuring Transformer Certification	5.67	3 of Schedule 10.8	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for two category 2 metering installations. Up to 324 category 2 metering installations with CTs certified without calibration being carried out.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Measuring transformers in-service burden.	5.68	2(1)(E) Of Schedule 10.8	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for two category 2 metering installations.	Moderate	Low	2	Identified
Future Risk Rating						**46**	
Indicative Audit Frequency						**3 months**	

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

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Remedial Action
Provision of Accurate Information	2.2	10.6 of Part 10	Develop validation reporting that is regularly run to identify inaccuracies in metering installation certification reports.	Investigating
Certification & Calibration Reports	3.6	11(1) of Schedule 10.4	Change the layout of the certification report to include the more relevant items clearly on the front page.	Investigating
Type test reports	4.12	5 of Schedule 10.8	Prepare and maintain a register of type test reports detailing checks conducted, whether compliance is achieved, the date checks were conducted and who conducted them.	Identified
ATH must not Certify Metering Installations under certain circumstances	5.1	8(1) Of Schedule 10.7	Develop and implement validation to ensure non-compliant installations are identified and remedied as soon as possible.	Identified
Certification as a lower category	5.7	6(2)(b) & (d) of Schedule 10.7	Obtain the following information from MEPs where certification as a lower category is performed: • confirmation that certification as a lower category is required, and • a copy of the historic data confirming the installation will either have a load less than 500 amps or consumption less than 0.5 GWh.	Identified

			Add the following information to certification reports where certification as a lower category is performed: • confirmation that certification has occurred in accordance with Clause 6 of Schedule 10.7, along with whether it is selected component or comparative certified, and • confirmation that the MEP has provided historic data confirming the suitability of the installation to be certified as a lower category.	Identified
Error calculation	5.30	22 of Schedule 10.7	Regarding the comparative recertification error and uncertainty calculation process - review the application of the ambient temperature influence to determine if the adjustment of the overall error figure is necessary.	Identified
			Regarding the comparative recertification error and uncertainty calculation process - investigate the possibility of using pulses from the meter or determine and add an allowance in the uncertainty calculation for the influence of the reaction time.	Investigating
			Regarding the comparative recertification error and uncertainty calculation process – record the error an uncertainty as single figures. Measured error, plus uncertainty = total error.	Investigating
CT certification stickers	5.46	41(1) and 41(9) of Schedule 10.7	Identify all invalid CT stickers and arrange for them to be removed from the relevant installations.	Identified

Issues

Issue	Description	Remedial action
Category 1 prevailing load tests	Table 3 states that for Category 1 metering installations, where recertification occurs without meter replacement, a prevailing load test must be conducted using a working standard. The industry does not have a Category 1 prevailing load test capability and to establish one would cost approx. $12,500,000 just for the working standards, then each job would take longer, which would also add to costs.	I recommend the Authority changes the Code to allow recertification of single meter Category 1 installations with a raw meter data output test but not a prevailing load test.

Persons Involved in This Audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Wells personnel assisting in this audit were:

Name	Title
Graham Wells	Managing Director
Leith Robertson	Engineering Manager

Contents

1. ADMINISTRATIVE

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

Code related audit information

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

Audit observation

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

Audit commentary

There are no exemptions in place.

1.2 Scope of Audit

Wells Instrument and Electrical Services Limited (Wells) is a Class B ATH and this audit was performed at their request, to encompass the Electricity Industry Participation Code requirement for an audit, in accordance with clause 16A.19(b).

The Authority has stipulated that the next audit was due by 13 May 2022, in accordance with clause 16A.19(b).

The audit was conducted in accordance with the ATH Audit Guidelines V1.3 produced by the Electricity Authority.

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

Class B Approval

(a) calibration of class 0.5 meters, class 1 meters and class 2 meters, and class 0.5 current transformers and class 1.0 current transformers, provided that the calibrations are carried out under their approved quality certification and in accordance with this Part, and included within the ATH audit for approval:

(b) installation and modification of metering installations:

(c) installation and modification of metering components:

(d) calibration of metering components on site:

(e) certification, using the selected component certification method, of:

(i) category 1 metering installations:

(ii) category 2 metering installations:

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

(f) certification, using the fully calibrated certification method, of—

(i) category 1 metering installations:

(ii) category 2 metering installations:

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

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

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

(i) inspection of:

(i) category 1 metering installations:

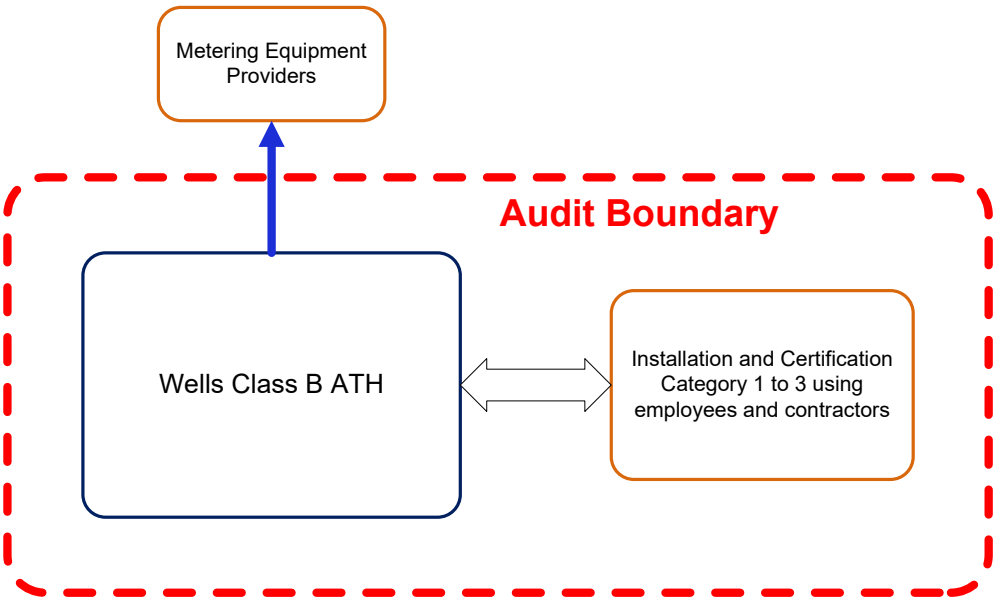
(ii) category 2 metering installations:

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

Wells 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. The Authority confirmed on 23 December 2021 that if an ATH is approved to certify a metering installation, then they are also approved to certify metering components.

Wells provides Test House services to metering equipment owners in respect of the installation and/or re-certification of Category 1 to Category 3 metering. Wells provides training, and also conducts internal audits to ensure the on-going compliance and competence of employees and contractors.

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



1.3 Previous Audit Results

The last audit was conducted in April 2021 by Brett Piskulic of Veritek. The audit found 18 non-compliance issues, and four recommendations were made. The current status of these matters is shown in the tables below. Most of the non-compliances are still existing and the four recommendations have not been adopted.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Accurate information	2.2	10.6 of Part 10	Each services access interface and metering installation type not recorded for 47 of 76 metering installations certified since 1 February 2021. Maximum interrogation cycle not recorded for each services access interface in 68 metering installations. Certification expiry dates incorrectly calculated for one category 2 metering installation. One category 1 metering installation certified using the selected component method had the method incorrectly recorded on the certification report as comparative recertification.	Still existing
Metering Installation Type	3.2	8(2) of Schedule 10.7	Each services access interface and metering installation type not recorded for 47 of 76 metering installations certified since 1 February 2021.	Still existing
Services Access Interface	3.5	10 of Schedule 10.4	Each services access interface not recorded for 47 of 76 metering installations certified since 1 February 2021.	Cleared
Certification at a Lower Category	3.10	6(4) Of Schedule 10.7	All information regarding lower category certification not included in the certification reports for three metering installations.	Still existing
Maximum interrogation cycle	3.14	36(3) & (4) of Schedule 10.7	Maximum interrogation cycle not recorded for each services access interface in 68 metering installations.	Cleared
Compliance with part 10	5.1	8(1) Of Schedule 10.7	Six category 2 installations certified with in-service burden lower than the burden range of the CTs. ICP 0000015643TR39C had an absolute error and uncertainty test result of 1.54%, meaning at least one of the components is operating outside its class.	Still existing

Subject	Section	Clause	Non-compliance	Status
Certification tests	5.12	9(1) of Schedule 10.7	Meter register not incrementing when raw meter date tests conducted on Intellihub Elster gRex meters.	Still existing for different issues
Test results	5.16	10(1)&(2) Of Schedule 10.7	Six category 2 installations certified with in-service burden lower than the burden range of the CTs. ICP 0000015643TR39C had an absolute error and uncertainty test result of 1.54%, meaning at least one of the components is operating outside its class.	Still existing
Selected component certification	5.18	11(4) of Schedule 10.7	Certification tests not completed at two metering installations certified using the selected component method.	Still existing
Comparative Recertification	5.19	12(2) of Schedule 10.7	Incorrect use of comparative recertification method for one installation.	Cleared
Certification Validity Periods	5.28	17 of Schedule 10.7	Certification expiry date incorrectly calculated for one category 2 metering installation.	Cleared
Determine Metering Installation Certification Expiry Date	5.34	27(1) & (2) Of Schedule 10.7	Certification expiry date incorrectly calculated for one category 2 metering installation.	Cleared
Measuring Transformers used in a Certified Metering Installation	5.37	28(4) Of Schedule 10.7	Six category 2 installations certified with in-service burden lower than the burden range of the CTs.	Still existing
Measuring Transformer Certification Expiry Date	5.38	29 of Schedule 10.7	CT Certification expiry dates incorrectly calculated for one category 2 metering installation.	Cleared
Low burden	5.40	31 Of Schedule 10.7	Six category 2 installations certified with in-service burden lower than the burden range of the CTs.	Still existing

Subject	Section	Clause	Non-compliance	Status
Measuring Transformer Certification	5.67	3 of Schedule 10.8	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for nine category 2 metering installations. Seven category 2 metering installations with CTs certified without calibration being carried out.	Still existing
Measuring transformers in-service burden.	5.68	2(1)(E) Of Schedule 10.8	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for nine category 2 metering installations.	Still existing
Notification of metering installations inaccurate or not fit for purpose	7.1	10.43(3) of Part 10	MEP was not notified that six metering installations with the in-service burden lower than the burden range of the CTs are not fit for purpose and therefore have cancelled certification.	Still existing

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Provision of Accurate Information	2.2	10.6 of Part 10	Develop validation reporting that is regularly run to identify inaccuracies in metering installation certification reports.	Still existing
Certification & Calibration Reports	3.6	11(1) of Schedule 10.4	Change the layout of the certification report to include the more relevant items clearly on the front page.	Still existing
Error calculation	5.30	22 of Schedule 10.7	Regarding the comparative recertification error and uncertainty calculation process - review the application of the ambient temperature influence to determine if the adjustment of the overall error figure is necessary.	Still existing
			Regarding the comparative recertification error and uncertainty calculation process - investigate the possibility of using pulses from the meter or determine and add an allowance in the uncertainty calculation for the influence of the reaction time.	Still existing

2. ATH REQUIREMENTS

2.1 Use of Contractors (Clause 10.3 of Part 10)

Code related audit information

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

Audit observation

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

Audit commentary

Wells uses employees and "field service partners" (contractors) to conduct field activities. All technicians are subject to the same training and monitoring program, which includes initial training by a specialised trainer followed by two days of fieldwork with a "buddy". Audits are completed of 5% of all jobs completed in the first four weeks followed by an on-going requirement of 3% and at least two "field observations" per year alongside on-going photo checking of all completed jobs. I checked the competency records to ensure they were complete and accurate. The competency matrix is up to date and recognises different levels of competence for different job types.

Audit outcome

Compliant

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

As mentioned in **section 2.1**, the photo checking process also checks the accuracy of recorded details, including meter readings and tariffs. If any discrepancies are identified the record can be sent back to the technician's PDA so they can make the correction to the source data. The checking process occurs on a daily basis and generally meets the requirement to ensure data is corrected "as soon as practicable".

It appears there are some gaps in the checking process. Three issues were identified during the audit but not during the checking process. The issues are as follows:

- 18 of 20 Category 2 certification reports had the selected component certification method recorded instead of the comparative method, many of these had measuring transformers recorded as certified but calibration tests were not conducted - I filtered the spreadsheet provided for Category 2 certifications for AMS, Counties and Influx and found 306 of 433 ICPs with selected component certification applied had a "field outcome" indicating that CTs were not replaced, for example "BAU Deployment", "Tariff change" and "AES install and CT test",
- the 18 installations above have CT certification stickers even though the CTs are not certified - these stickers will need to be removed,
- four Category 2 certification reports had the incorrect burden range recorded or did not have the burden range recorded, and
- Seven Category 2 certification reports had the installation type recorded as NHH, but they were actually HHR.

I recommend that Wells develop validation reporting that is regularly run to identify inaccuracies in metering installation certification reports.

Recommendation	Description	Audited party comment	Remedial action
Provision of accurate information	Develop validation reporting that is regularly run to identify inaccuracies in metering installation certification reports.	The options for such a facility are being discussed with our software development team, however at this stage it is uncertain how easy this will be.	Investigating

This clause also requires that information is "not misleading…" Certification reports contain a section called "SET DEFAULT ANSWERS", which contains some information relevant to the ICP in question but most of the information is not relevant to the specific ICP and is therefore misleading for those reading the reports. An extract is shown below.

SET DEFAULT ANSWERS	Completed:	14 Jun 2021 06:11
Set Defaults		Yes
---------- EIPC Defaults ----------		
Cert Date		14/06/2021
Expiry Date		14/06/2031
Site ATH		WELLS
Generation Legacy		Legacy
Generation Advanced		Advanced
Default Meter Category WC		Cat 1
Default Meter Category CT		Cat 2
Existing Asset Action		Removed
Phase WC		1
Phase CT		3
Multiplier		20
Unit Of Measure		KWh
Energy Flow Direction		Exit
Meter Validity Period		15
SA Interface		Remote
Cert Method		Selected Component
---------- Contract Specific Defaults ----------		
Category		Cat 1
Asset Owner		NGCM
Meter ATH		WELLS Test House
Installation Type		HHr
Default No Answer		

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 10.6 of Part 10 From: 01-Feb-21 To: 11-Apr-22	18 of 20 Category 2 certification reports had the selected component certification method recorded instead of the comparative method. Many of these had measuring transformers recorded as certified but calibration tests were not conducted. The 18 installations above have CT certification stickers even though the CTs are not certified. These stickers will need to be removed. It's likely a further 306 selected component certifications are actually comparative. Four Category 2 certification reports had the incorrect burden range recorded or did not have the burden range recorded. Seven Category 2 certification reports had the installation type recorded as NHH, but they were actually HHR. The "SET DEFAULT ANSWERS" section of certification reports is misleading. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**

Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The MEP has correctly recorded the certification information in the registry therefore the impact is recorded as low.

Actions taken to resolve the issue	Completion date	Remedial action status
Records for the 18 installations have been corrected and the MEPs advised by email.	Completed	Identified
Revisits to correct certification stickers where required are being requested.	30-6-2022	
Further reviews of job data will be undertaken to check if there are in fact more instances of incorrect Certification Method.	31-5-2022	
Incorrect Burden Ranges have been corrected and the MEPs advised by email. Note that some installation's jobs did not have provision for the range to be recorded because the jobs were created prior to the 1st Feb 2021 code change being catered for in our workflows.	Completed	
Records for the installations with incorrect installation type will be corrected and the MEPs advised by email.	31-5-2022	
It is apparently not straightforward to omit the "Set Default Answers" task from the certification report, but a warning label can be added to all workflows to highlight that the default answers do not form part of the certification report.	31-5-2022	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit.	31-5-2022	
-An initial Cat-2 Teams Training session has been held this week.	Completed	
-Cat-2 Photochecker Training and Check-points are being reviewed.	31-5-2022	
-Cat-2 Photochecker actions document has been amended to include additional Check-points.	Completed	
-Additional new Cat-2 Datachecking being put in place.	31-5-2022	
-Options for automated Datachecking being investigated	30-6-2022	

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

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

2.4 ATH Approval (Clause 10.40 of Part 10)

Code related audit information

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

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

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

- *has the facilities and procedures to reliably meet, for the requested term of the approval, the minimum requirements of this Code for the class or classes of ATH for which it is seeking approval*
- *has had an audit under Part 16A*
- *is a fit and proper person for approval.*

Audit observation

I checked the most recent application for re-certification.

Audit commentary

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

An audit was completed in May 2021 and the report was submitted to the Authority.

Audit outcome

Compliant

2.5 ATH Requirements (Clause 10.41 of Part 10)

Code related audit information

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

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

Audit observation

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

Audit commentary

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

This clause requires Wells to:

- *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*

Whilst there are a number of non-compliant field practices and inaccurate certification records, the proposed improvements to controls should ensure future compliance with the points identified above.

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

- access to basic insulation,
- livening practices; specifically, polarity testing,
- safety practices with regard to the management of asbestos switchboards - training for this includes an asbestos awareness presentation then a workshop trial followed by supervision on site, and
- general safety practices and the appropriate use and testing of personal protective equipment.

Updates of field procedures are communicated via weekly technical metering reminders. The reminders are sent through Microsoft Teams and require acknowledgement via responses to questions by technicians.

This clause also refers to employment related enactments, which for Wells, includes their employer license. The operation of an employer licence system is included in the ISO scope which is subject to audit. The employer licence system is also subject to a separate audit under the provisions of the employer licence approval. The employer licence allows Wells to use metering technicians who may not have electrical registration granted by the Electrical Workers Registration Board.

Audit outcome

Compliant

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

Wells has ISO 9001:2008 registration for the Class B Test House. The scope is appropriate and is noted as:

- *Supply and installation of metering equipment*
- *The reading and data collection services for non-half hour electricity meters*

- *The supply of electricity field services including prescribed electrical work*
- *The supply of gas meter and water meter reading services*
- *The design and development of software for field services and task information management systems by E-Merge Data Solutions Limited from the New Plymouth office*
- *The design supply of electrical installation and maintenance services to commercial, industrial and domestic users by Wells Instrument and Electrical (MW) Limited.*

Wells provided a copy of their most recent ISO 9001:2015 audit report, dated March 2022, which was conducted by Telarc SAI Limited. No non-conformances were recorded and three opportunities for improvement were identified, which are shown in the table below.

Report section	Opportunity for improvement	Wells comment
Business planning	The Electrical Licence assessment findings were not captured within the FY2021-22 HSE Business Plan, and the organisation is encouraged to consider these actions as well in future planning	The Electrical Licence assessment findings have been included in HSEQ Business Plan Agenda for 2022-23
Internal audit	Current HSEQ Wells audit proforma has been based on the ISO SL Annex Headings. Consideration of modifying the audit template for continual improvement by addition of a verification column to retain the previous audit findings may assist. This will result in including both the standard requirements of ISO Standard, source data within Wells IBMS, verification to note evidence sighted and the addition of the new column to compare previous assessment (i.e. historic) with current assessment.	The audit template has been modified by the addition of a verification column to retain the previous audit findings and is included in the MASTER templates.
Management review	Consideration of mapping all the Management Review Inputs / Outputs against the current meeting structures to demonstrate conformance in meeting all requirements. This approach (often referred to as a communication matrix) will allow easy identification of both communication forums and subject topics	Mapping of all the Management Review Inputs / Outputs against the current meeting structures to demonstrate conformance in meeting all requirements has been completed as a Word table.

Audit outcome

Compliant

2.7 Organisation and Management (Clause 15 of Schedule 10.4)

Code related audit information

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

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

Audit observation

I checked records in the quality manual to confirm compliance.

Audit commentary

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 test house; and a quality manager (however named), with responsibility for the quality management certification and the implementation of the quality management system. Leith Robertson is appointed as Technical Manager and is currently covering the vacant position of Quality Manager. Leith has appropriate qualifications and experience in these roles.

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

The quality management system meets the requirements of the Code.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Wells is not approved as a class A ATH.

Audit commentary

Wells is not approved as a class A ATH.

Audit outcome

Not applicable

2.10 Material Change Requirements (Clause 16A.11)

Code related audit information

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

Audit observation

Wells has not conducted any material changes.

Audit commentary

Wells has not conducted any material changes.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

2.12 Accommodation & Environment (Clause 1 of Schedule 10.4)

Code related audit information

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

(i) the personnel specified

(ii) the Authority

(iii) an auditor conducting an audit

(iv) any other person who is, at all times, directly supervised by a member of personnel specified.

Audit observation

Wells does not operate a laboratory function; their scope is limited to field installation work.

Audit commentary

Wells does not operate a laboratory function; their scope is limited to field installation work.

Audit outcome

Not applicable

2.13 Compensation Factors (Clause 8 of Schedule 10.4)

Code related audit information

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

Audit observation

I checked the documentation in relation to compensation factors and I checked 67 certification reports.

Audit commentary

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

ICP 0000616050WPE6E had a compensation factor of "1" in the "SET DEFAULT ANSWERS" section but had the correct compensation factor in other fields. The MEP and trader used a compensation factor of "1" for the preparation of submission information. This matter is discussed further in **sections 2.2 and 5.31**where non-compliance is recorded.

Audit outcome

Compliant

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

Code related audit information

An ATH must ensure that a certification sticker is:

- made of weather-proof material

- permanently attached

- filled out using permanent markings.

Audit observation

I checked Wells' component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause.

Audit outcome

Compliant

2.15 Interference with Metering Installations (Clause 10.12)

Code related audit information

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

Audit observation

I audited this clause by exception.

Audit commentary

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

Audit outcome

Compliant

3. METERING RECORDS AND REPORTS

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

Code related audit information

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

The metering installation certification report must specify whether the installation is half hour, non-half hour or half hour and non-half hour metering.

The metering installation certification report must also record each services access interface and the conditions under which each services access interface may be used.

Audit observation

I checked 67 certification reports to confirm compliance.

Audit commentary

All services access interfaces are correctly recorded for all 67 certification reports checked.

Seven Category 2 certification reports had the installation type recorded as NHH instead of HHR. I've recommended in **section 2.1** that validation occurs on this field to identify and correct errors as soon as possible.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 8(2) of Schedule 10.7 From: 01-Feb-21 To: 11-Apr-22	Seven Category 2 certification reports record the installation type as NHH instead of HHR Potential impact: Low Actual impact: None Audit history: Twice Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as strong because they reduce errors to an acceptable level. There is no impact because the MEP normally determines the installation type; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Records for the installations with incorrect installation type will be corrected and the MEPs advised by email.	31-5-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

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

Code related audit information

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

Audit observation

I checked 67 certification reports to confirm compliance.

Audit commentary

All reports correctly recorded the metering category.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Wells does not calibrate components.

Audit commentary

Wells does not calibrate components.

Audit outcome

Not applicable

3.5 Services Access Interface (Clause 10 of Schedule 10.4)

Code related audit information

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

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

Audit observation

I checked the design reports and a sample of 67 certification records to confirm compliance.

Audit commentary

The services access interfaces were correctly recorded for all 67 certification reports.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

I requested a sample of 67 certification records to confirm compliance.

Audit commentary

I reviewed Wells' records for each MEP where they provide ATH services. Certification reports are produced for all installations; certification reports are produced for all components.

CTs are certified in accordance with the Code.

The certification reports are very difficult for other participants to read and understand. As noted in many previous audit reports, I repeat the recommendation that Wells changes the layout of the report to include the more relevant items clearly on the front page, as follows:

- ICP,
- metering installation certification date,
- metering installation certification expiry date,
- metering category,
- certification type (selected component, comparative, fully calibrated, alternative, insufficient load, lower category),
- HHR or NHH,
- compensation factor, and
- electrical connection date (if known and if the ATH is also the agent).

Recommendation	Description	Audited party comment	Remedial action
11(1) of Schedule 10.4	Change the layout of the certification report to include the more relevant items clearly on the front page.	This has been raised several times in the past by both clients and auditors and we agree that it would be most desirable, however we are told by our software developers that at this stage it is not a straightforward matter to resolve.	Investigating

Audit outcome

Compliant

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

Code related audit information

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

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

- uniquely identified

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

Audit observation

I checked the certification records for 67 metering installations along with the storage practices.

Audit commentary

All records were available, and records are stored indefinitely.

Audit outcome

Compliant

3.8 Retention of Records (Clause 13 of Schedule 10.4)

Code related audit information

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

Audit observation

I checked the certification records for 67 metering installations along with the storage practices.

Audit commentary

All records were available, and records are stored indefinitely.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the processes and KPIs in place to determine compliance.

Audit commentary

The targets in place are to provide 90% of records within one day of certification and 100% within two days. There are some instances where this is not achieved due to follow up activities in relation to specific sites. The Code actually requires the ATH to send records within five business days of creation of the record, not from the certification date. I have therefore concluded that compliance is achieved with this requirement because the record has not been "created" until all of the information is complete.

Wells confirmed that they are not acting as an agent to any MEPs for the storage of records.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the process for certification as a lower category and the certification records for five metering installations certified at a lower category.

Audit commentary

The five certification records were for metering installations which were nominally category 3 and had been certified as category 2. Details of the certifications are included in the table below:

ICP	CT Ratio	Nominal Category	Certified Category	Protection rating	Comments
1001149290CK6D4	600/5	3	2	400 amps	Certification report confirmed the protection rating.
1000755017UN491	800/5	3	2	720 amps	The certification report confirms monitoring is required by the MEP.
0006515592RN711	800/5	3	2	600 amps	The certification report confirms monitoring is required by the MEP.
0000100483UNF01	800/5	3	2	Not recorded	The certification report confirms monitoring is required by the MEP.
0000164833CK11A	800/5	3	2	630 amp	The certification report does not state that monitoring must occur.

This clause requires the ATH to prepare a certification report including "*…all information required to demonstrate compliance".* The Code isn't clear what information is required to be sent to the MEP, but the gaps in the process appear to be as follows:

1. Wells does not have a process to confirm the MEP is requiring metering installations to be certified as a lower category.
2. Wells is permitted to certify as a lower category if they "consider it appropriate in the circumstances". Wells does not have confirmation that the MEP has confirmed the historic load has not exceeded 500 amps or 0.5 GWh, therefore it does not appear Wells has sufficient information to confirm certification as a lower category is appropriate. ICP 0000164833CK11A was a new connection, therefore it may be difficult to determine certification as a lower category is appropriate. One option is to identify similar ICPs and obtain historic consumption or maximum demand information.
3. The certification report does not confirm that certification has occurred under Clause 6 of Schedule 10.7.

I recommend the following information is sought from the MEP in all cases where certification as a lower category is to be conducted:

1. Confirmation that certification as a lower category is required.
2. A copy of the historic data confirming the installation will either have a load less than 500 amps or consumption less than 0.5 GWh.

The certification report should contain the following information:

1. Confirmation that certification has occurred in accordance with Clause 6 of Schedule 10.7, along with whether it is selected component or comparative certified.
2. Confirmation that the MEP has provided historic data confirming the suitability of the installation to be certified as a lower category.

This section is only concerned with the recording of information to demonstrate compliance. **Section 5.7** discusses processes for confirming that certification as a lower category is appropriate.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.10 With: Clause 6(4) Of Schedule 10.7 From: 01-Apr-21 To: 15-Apr-22	All information regarding lower category certification not included in the certification reports for four metering installations. Potential impact: Low Actual impact: None Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate because there is room for improvement. If the MEP does not monitor load each month certification will be cancelled; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Unclear what, if any, actions can resolve the current situation since it is now historic. Ie we cannot change the failure to obtain all information before certification, and since the MEP has acknowledged the certification it seems that anything done now would be redundant.	-	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
Processes for obtaining clarification from MEPs are being developed, but they will introduce a new Turn-Down Reason in the workflows to request information from the MEP and await the required lower category certification instruction confirmation and historic usage data. This is necessary because unless the instruction is in the original job note, it will not be known until the tech arrives at site that certification at a lower category is going to be required.	31-5-2022	

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

Code related audit information

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

- the meter manufacturer's required recommendations for regular maintenance

- any maintenance that has been carried out on the meter, such as battery monitoring and replacement.

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

Audit observation

I checked process documentation, conducted a walk-through of the process, and checked 67 certification records.

Audit commentary

As a Class B ATH, Wells 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.

The maximum interrogation cycle is recorded in the certification reports.

Audit outcome

Compliant

3.12 Meter Certification Expiry Date (Clause 27(5) of Schedule 10.7)

Code related audit information

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

Audit observation

I checked 67 certification records to confirm compliance.

Audit commentary

Meter certification expiry dates are recorded in the certification reports.

Audit outcome

Compliant

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

Code related audit information

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

- the manufacturer's recommendations for any regular maintenance required for the measuring transformer

- any maintenance that has been carried out on the measuring transformer.

Audit observation

I checked whether any measuring transformers required maintenance.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

- the period of inherent data loss protection for the metering installation

- the period of memory availability given the data storage device configuration

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

Audit observation

I checked processes and the records for 67 metering installations to confirm compliance.

Audit commentary

All certification reports now contain all services access interfaces and associated maximum interrogation cycles.

Audit outcome

Compliant

4. CALIBRATION AND CERTIFICATION OF METERING COMPONENTS

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

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

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

Audit commentary

Wells uses the correct standards.

Audit outcome

Compliant

4.3 Test Equipment (Clause 2 of Schedule 10.4)

Code related audit information

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

Audit observation

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

Audit commentary

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

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, sealing tools and stickers.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the calibration records and processes for calibration of Wells test equipment.

Audit commentary

Wells has 10 Hioki working standards, including three owned by contractors, used for comparative certification of Category 2 metering installations. All of these standards have current calibration certificates. The Test Equipment Register in SharePoint sends an automated email notification when recalibration is due.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the calibration records and processes for calibration of Wells test equipment.

Audit commentary

Wells has 10 Hioki working standards, including three owned by contractors, used for comparative certification of Category 2 metering installations. All of these standards have current calibration certificates, and the calibrations are completed within the 12-month interval required by this clause.

Audit outcome

Compliant

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

Code related audit information

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

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

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

Audit observation

Wells does not have a reference standard.

Audit commentary

Wells does not have a reference standard.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells does not use HV working standards.

Audit commentary

Wells does not use HV working standards.

Audit outcome

Not applicable

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

Code related audit information

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

- calibrates the test bench as if it was a working standard

- carries out a testing system accuracy test, using approved reference standards before completing the calibration report.

Audit observation

Wells does not conduct calibration of metering components and does not have a test bench.

Audit commentary

Wells does not conduct calibration of metering components and does not have a test bench.

Audit outcome

Not applicable

4.9 Calibration Errors (Clause 5 of Schedule 10.4)

Code related audit information

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

Audit observation

I checked Wells' understanding of this requirement through interview. I checked whether this situation had occurred.

Audit commentary

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

Audit outcome

Compliant

4.10 Measurement Traceability (Clause 6 of Schedule 10.4)

Code related audit information

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

Audit observation

Wells conducts comparative certification, which does not fully meet the definition of calibration, therefore Wells has not conducted any calibration activities.

Audit commentary

Wells conducts comparative certification, which does not fully meet the definition of calibration, therefore Wells has not conducted any calibration activities.

Audit outcome

Not applicable

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

Code related audit information

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

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

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

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

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

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

Audit observation

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

Audit commentary

Wells does not calibrate components.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

I checked the certification records for 67 metering installations to confirm compliance.

Audit commentary

Wells certifies data storage devices in accordance with these clauses. The certification report is combined with the metering installation certification report and contains the required details. Wells has a directory of type test reports, which contained reports for the three I selected based on currently used data storage devices.

The clauses for type testing and data storage device certification require the ATH to determine a number of factors, including:

- whether the type testing is appropriate for the model and version of meter,
- that a type test report is produced that:
    - confirms the meter's technical characteristics, and
    - confirms the range of environmental conditions within which the meter has been proven accurate and reliable, and
    - confirms that the meter performs the functions for which it was designed, and
    - confirms that the meter complies with the requirements of this Part, and
    - records the tests undertaken by the approved test laboratory and the reasons why the ATH considers that they are appropriate
- that each data storage device is installed so that onsite interrogation is possible without the need to interfere with seals, and
- that each data storage device has a dedicated power supply unless the data storage device is integrated with another metering component,
- that that each data storage device in the metering installation:
    - is compatible with each other metering component of the metering installation, and
    - is suitable for the electrical and environmental site conditions in which it is installed, and
    - has been certified under Schedule 10.8, and

- has appropriate electrical separation between all of its outputs and inputs, and all of its outputs and inputs are rated for purpose, and
- has no outputs that will interfere with the operation of the metering installation, and
- records periods of data identifiable or deducible by both date and time on interrogation; and

It's clear that the mere availability of a type test report is insufficient to achieve compliance. There are a number of specific items that the ATH is required to check and confirm. I therefore recommend Wells develops a type test report schedule, listing all type test reports with confirmation that the items above have been checked and confirmed. Each record should have the date the checks were performed and details of who conducted the checks.

Recommendation	Description	Audited party comment	Remedial action
Type test reports	Prepare and maintain a register of type test reports detailing checks conducted, whether compliance is achieved, the date checks were conducted and who conducted them.	A register and review process will be developed as recommended. It is likely that Sharepoint will become the central repository for the register and review & check information	Identified

Clause 38(2)(b) of schedule 10.7 requires confirmation in the metering installation certification report that each data storage device in the metering installation:

- 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, and
- 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.

Compliance with this clause is discussed in **section 5.45**.

Audit outcome

Compliant

4.13 Metering Component Stickers (Clause 8(1) and 8(4) of Schedule 10.8)

Code related audit information

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

If an ATH certifies the metering component on the same day it certifies the metering installation that the metering component is installed in, the ATH may combine the certification stickers and attach it to the metering installation in accordance with clause 41 of Schedule 10.7.

Audit observation

I checked Wells' component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause. I checked photos of 67 metering installations which confirmed they were correctly applied.

Wells has not used combined component and installation certification stickers.

Audit outcome

Compliant

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

Code related audit information

A metering component certification sticker must show:

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

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

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

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

c) the date on which the metering component was certified

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

Audit observation

I checked Wells' component stickers to confirm compliance.

Audit commentary

All component stickers are compliant with this clause. I checked photos of 67 installations which confirmed they were correctly applied.

Audit outcome

Compliant

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

Code related audit information

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

The sealing system will identify:

- the ATH who affixed the seal

- the person (or the sealing tool) who applied the seal

- when the seal was applied.

Audit observation

I checked the quality documentation and a sample of 67 certification records to confirm compliance.

Audit commentary

The quality manual contains a section for the management and application of seals.

Individually numbered seals are available for use and there is a process for their application. The most common method is “wire and ferrule” with numbered sealing tools. During the audit it was confirmed that the sealing tool register is up to date. I checked the photos for 67 installations to confirm the correct application of seals. Compliance is confirmed.

When a seal is discovered to be broken or missing, there is a procedure to ensure the meter owner is notified. Wells records any seals they have broken as an ATH.

Audit outcome

Compliant

5. CALIBRATION AND CERTIFICATION OF METERING INSTALLATIONS

5.1 ATH must not Certify Metering Installations under certain circumstances (Clause 8(1) Of Schedule 10.7)

Code related audit information

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

Audit observation

I checked a sample of 53 Category 2 certification records to confirm compliance, and I also checked a database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes.

Audit commentary

Clause 31 of schedule 7 requires the ATH to ensure that the in-service burden is within the burden range of the measuring transformers. The recording of burden ranges is discussed in **section 5.67**.

My checks of 53 category 2 metering installation certification reports found seven of the reports had in-service burden lower than the burden range of the CTs, the table below shows details of the seven installations,

ICP	MEP	Certification date	CT Ratio	Rated burden	Burden range VA	Lowest in-service burden	Burden resistors added
0000130662UN2D5	NGCM	26/07/2021	100/5	10VA	2.5-10VA	1.71	Yes but not of sufficient rating
0006475345RN7AB	NGCM	3/09/2021	300/5	5VA	1.25-5VA	0.04	No
0000452438WT26B	NGCM	27/01/2022	200/5	5VA	1.25-5VA	0.41	No
0015708565EL7DE	FCLM	3/08/2021	200/5	5VA	1.25-5VA	0.53	No
0000616050WPE6E	FCLM	16/06/2021	300/5	5VA	1.25-5VA	1.12	No
0001241205PN7EB	FCLM	5/05/2021	250/5	5VA	1.25-5VA	0.62	No
0003124120WF602	FCLM	5/05/2021	200/5	5VA	1.25-5VA	0.63	No

Analysis of database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes found an additional 48 of 372 (13%) installations had low burden and burden resistors were not added. Wells identified a further 13 installations with low burden and no resistors following the audit. These installations do not comply with Part 10 and should not have been certified. At the time of the audit there was no validation reporting in place to identify these examples and the photo checking process

did not have a specific step to check for low burden. I recommend validation is implemented to ensure non-compliant installations are identified.

Recommendation	Description	Audited party comment	Remedial action
Low burden	Develop and implement validation to ensure non-compliant installations are identified and remedied as soon as possible.	-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	Identified

Two ICPs have absolute errors (including uncertainty) greater than the combined class of the components. ICP 0000120467UND7C has an error of 2.24%. The CTs are class 1 and the meter is class 1, which means the CTs or the meter are recording outside their class. The other possibility is that there is an additional uncertainty component recorded, possibly in relation to using readings from the registers to conduct the prevailing load test rather than pulse outputs. ICP 0000604141UNEE5 has an absolute error of 2.3%. Once again, the components are class 1. The comments above are also valid for this ICP. In both cases, whilst the minimum load level was achieved, the load was quite low and testing over a longer period may have led to a more accurate result.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.1 With: Clause 8(1) Of Schedule 10.7 From: 01-Apr-21 To: 17-Apr-22	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class. Potential impact: High Actual impact: High Audit history: Three times Controls: Moderate Breach risk rating: 6

Audit risk rating	Rationale for audit risk rating
High	At the time of the audit the controls were weak because they were insufficient to identify examples of non-compliant metering installations. Following the audit, the document called "Photo Checking Actions – Cat-1 & Cat-2" was updated to include checks of low burden and errors outside the combined class error of the components. I have therefore recorded the controls as moderate, and their effectiveness will be checked during the next audit. A presentation by the Electricity Authority in April 2019 indicated the total cost to a consumer over the 10-year certification where CTs were under burdened was between $3,200 and $9,200. This assumption was based on over recording of 1.0%, but more recent information suggests over recording of 0.5% is a more reasonable assumption. Therefore, the total cost to consumers for the 68 ICPs identified could be between $108,800 and $312,800, or $10,880 to $31,280 per annum. There is also an impact on five MEPs because certification is cancelled for these installations, and this can have an impact their compliance and potentially their audit frequency. I have therefore concluded the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
Installations with low burden have been identified, the MEPs advised by email. Revisits for re-testing and burden resistor installation if required are now being planned. Installations with error greater than class sum have been identified, the MEPs advised by email. Revisits for re-testing are now being planned.	Completed 31-7-2022 Completed 31-7-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated Validation is in the workflows to prevent a job from progressing when error is greater than class sum, however these two jobs were created before that validation was added last year.	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022 Completed	

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

Code related audit information

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

Audit observation

I checked certification records for 67 metering installations to confirm compliance.

Audit commentary

All 67 certification reports had the metering category recorded correctly.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the current suite of design reports and the certification records for 67 metering installations.

Audit commentary

Wells uses design reports modified in conjunction with MEPs. These reports contain all of the required information, including configuration schemes and schematic drawings. A design report reference was recorded in all of the 67 certification records checked.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

I checked the current suite of design reports and the certification records for 67 metering installations.

Audit commentary

Wells uses design reports modified in conjunction with MEPs. These reports contain all of the required information, including configuration schemes and schematic drawings. A design report reference was recorded in all of the 67 certification records checked. The most common design report change is the addition of burden resistors. The certification report states where this has occurred.

Audit outcome

Compliant

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

Code related audit information

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

- a protection device, like a fuse or a circuit breaker, is installed so that it limits the maximum current; or

- the MEP provides evidence from historical data that the maximum current will be lower than the current setting of the protection device for the category that metering installation is currently certified at; or

- the components in the metering installation will use less than 0.5 GWh in any 12-month period; or

- the MEP provides evidence from historical data that the installation will use less than 0.5 GWh in any 12-month period.

Audit observation

I checked the process for certification as a lower category and the certification records for five metering installations certified at a lower category.

Audit commentary

Two of the five certifications were of nominally category 3 installations certified at category 2 on the basis of there being protection installed which limits the maximum current to a level lower than 500 amps. As recorded in **section 3.10** the required details including reference to protection devices with current ratings were included in the certification reports. Details of the certifications are included in the table below:

ICP	Job No	CT Ratio	Nominal Category	Certified Category	Protection rating	MEP advised to monitor
0006533760RN189	4884676	1200/5	3	2	400 amps	Not required
0005895545RN5D5	4890638	1200/5	3	2	300 amps	Not required

Audit outcome

Compliant

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

Code related audit information

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

- confirm the suitability and operational condition of the protection device

- record the rating and setting of the protection device in the metering records

- seal the protection device

- apply, if practicable, a warning tag or label to the seal.

Audit observation

I checked the process for certification as a lower category and the certification records for five metering installations certified at a lower category.

Audit commentary

Two of the five certifications were of nominally category 3 metering installations certified at category 2 on the basis of there being protection installed which limits the maximum current to a level lower than 500 amps. As recorded in **section 3.10** the required details including reference to protection devices with current ratings were included in the certification reports. Details of the certifications are included in the table below:

ICP	Job No		CT Ratio	Nominal Category	Certified Category	Protection rating	MEP advised to monitor
0006533760RN189	4884676		1200/5	3	2	400 amps	Not required
0005895545RN5D5	4890638		1200/5	3	2	300 amps	Not required

Audit outcome

Compliant

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

Code related audit information

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

- there has been a request to do so from the MEP,

- the MEP provides evidence from historical data that the maximum current will be lower than the current setting of the protection device for the category that metering installation is currently certified; and

- the ATH considers it is appropriate to do so in the circumstances.

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

Audit observation

I checked the process for certification as a lower category and the certification records for five metering installations certified at a lower category.

Audit commentary

The five certification records were for metering installations which were nominally category 3 and had been certified as category 2. Details of the certifications are included in the table below:

ICP	CT Ratio	Nominal Category	Certified Category	Protection rating	Comments
1001149290CK6D4	600/5	3	2	400 amps	Certification report confirmed the protection rating.
1000755017UN491	800/5	3	2	720 amps	The certification report confirms monitoring is required by the MEP
0006515592RN711	800/5	3	2	600 amps	The certification report confirms monitoring is required by the MEP
0000100483UNF01	800/5	3	2	Not recorded	The certification report confirms monitoring is required by the MEP
0000164833CK11A	800/5	3	2	630 amp	The certification report does not state that monitoring must occur.

This clause requires the ATH to prepare a certification report including "…*all information required to demonstrate compliance".* The Code isn't clear what information is required to be sent to the MEP, but the gaps in the process appear to be as follows:

1. Wells does not have a process to confirm the MEP is requiring metering installations to be certified as a lower category.
2. Wells is permitted to certify as a lower category if they "consider it appropriate in the circumstances". Wells does not have confirmation that the MEP has confirmed the historic load has not exceeded 500 amps or 0.5 GWh, therefore it does not appear Wells has sufficient information to confirm certification as a lower category is appropriate. ICP 0000164833CK11A was a new connection, therefore it may be difficult to determine certification as a lower category is appropriate. One option is to identify similar ICPs and obtain historic consumption or maximum demand information.
3. The certification report does not confirm that certification has occurred under Clause 6 of Schedule 10.7.

I recommend the following information is sought from the MEP in all cases where certification as a lower category is to be conducted:

1. Confirmation that certification as a lower category is required.

2. A copy of the historic data confirming the installation will either have a load less than 500 amps or consumption less than 0.5 GWh.

The certification report should contain the following information:

1. Confirmation that certification has occurred in accordance with Clause 6 of Schedule 10.7, along with whether it is selected component or comparative certified.
2. Confirmation that the MEP has provided historic data confirming the suitability of the installation to be certified as a lower category.

Recommendation	Description	Audited party comment	Remedial action
Certification as a lower category	Obtain the following information from MEPs where certification as a lower category is performed: • confirmation that certification as a lower category is required, and • a copy of the historic data confirming the installation will either have a load less than 500 amps or consumption less than 0.5 GWh. Add the following information to certification reports where certification as a lower category is performed: • confirmation that certification has occurred in accordance with Clause 6 of Schedule 10.7, along with whether it is selected component or comparative certified, and • confirmation that the MEP has provided historic data confirming the suitability of the installation to be certified as a lower category.	Processes for obtaining clarification from MEPs are being developed, but they will introduce a new Turn-Down Reason in the workflows to request information from the MEP and await the required lower category certification instruction confirmation and historic usage data. This is necessary because unless the instruction is in the original job note, it will not be known until the tech arrives at site that certification at a lower category is going to be required. As discussed during the audit, a new option will be added to the Con-X options for certification method of "Comparative at Lower Category"	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.7 With: Clause 6(2)(b) & (d) of Schedule 10.7 From: 01-Apr-21 To: 17-Apr-22	Wells does not have sufficient information to determine certification as a lower category is appropriate. Including for ICP 0000164833CK11A which was a new connection, where historic data from a similar installation may be required to confirm the load or consumption will not exceed the thresholds. Potential impact: Medium Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	At the time of the audit the controls were weak because they were insufficient to identify examples of non-compliant metering installations. Following the audit, the document called "Photo Checking Actions – Cat-1 & Cat-2" was updated to include checks of certification as a lower category. I have therefore recorded the controls as moderate, and their effectiveness will be checked during the next audit The impact could be that the CTs become overloaded if the demand is not monitored or the consumption could exceed the required thresholds, meaning more accurate metering and HHR settlement is required.

Actions taken to resolve the issue	Completion date	Remedial action status
Unclear what, if any, actions can resolve the current situation since it is now historic. Ie we cannot change the failure to obtain all information before certification, and since the MEP has acknowledged the certification it seems that anything done now would be redundant.	-	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Processes for obtaining clarification from MEPs are being developed, but they will introduce a new Turn-Down Reason in the workflows to request information from the MEP and await the required lower category certification instruction confirmation and historic usage data. This is necessary because unless the instruction is in the original job note, it will not be known until the tech arrives at site that certification at a lower category is going to be required.	31-5-2022	

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

Code related audit information

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

Audit observation

I checked the process for certification as a lower category and the certification records for five metering installations certified at a lower category.

Audit commentary

In all five examples checked Wells visited the site at the time of certification. Comment is made in **section 5.8** regarding suitability of metering installations to be certified as a lower category.

Audit outcome

Compliant

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

Code related audit information

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

a) the selected component certification method if the metering installation is category 1, 2, or 3; or

b) the fully calibrated certification method.

Audit observation

I checked certification records for 67 metering installations to confirm compliance.

Audit commentary

Wells uses the comparative recertification method of certification for recertification of Category 2 metering installations and the selected component method for new installations or where components are replaced.

Audit outcome

Compliant

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

Code related audit information

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

a) an approved statistical sampling process for category 1 metering installations; or

b) the approved comparative recertification method for a category 2 metering installation.

Audit observation

I checked certification records for 67 metering installations to confirm compliance.

Audit commentary

Wells uses the comparative method of certification for recertification of category 2 metering installations and the selected component method for new installations or where components are replaced.

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Wells has not conducted certification of installations above Category 2 during the audit period.

Audit commentary

Wells has not conducted certification of installations above Category 2 during the audit period.

Audit outcome

Compliant

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

Code related audit information

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

- a prevailing load test

- an installation or component configuration test

- a raw meter data output test.

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

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

To carry out a raw meter data output test for a category 1 metering installation or category 2 metering installation, the ATH must apply a load on each phase that is:

- *greater than 5% of the meter's maximum rated current for category 1 installations,*
- *10 amps on each phase for category 2 metering installations.*

In addition, the ATH must use either the working standard referred to in subclause (1)(a) or an ammeter in good working order with an accuracy range of +/-5% to measure the load applied to the metering installation and recording the resulting increment of the meter register value over a measured period of time or recording the resulting accumulation of pulses from the load over a measured period of time.

The ATH must also ensure that the change in the meter register that occurs under subclause (ii)(A) or (ii)(B) is at least "1" in the least significant digit, or one mark if the least significant digit does not have numerical markings.

If the meter is a Ferraris disc meter, the ATH must undertake two raw meter data output tests in which the second test must have a load applied to the meter that is at least double the load applied in the first test.

To carry out a raw meter data output test for a half-hour installation, the ATH must either compare the output from a working standard to the raw meter data from the metering installation for a minimum of 1 trading period, or if the raw meter data is to be used for the purposes of Part 15, confirm that the MEP's back-office processes include a comparison of:

- *the increment of the accumulating meter registers, and*
- *the sum of the half-hour metering raw meter data for the same period.*

Audit observation

I checked process documentation and 67 certification reports to confirm compliance.

Audit commentary

This clause was changed from 1st February 2021 introducing minimum load requirements for ATHs when conducting raw meter data tests. The minimum load required on each phase is:

- greater than 5% of the meter's maximum rated current for category 1 installations,
- 10 amps on each phase for category 2 metering installations.

When conducting a raw meter data test the code change also requires the ATH to record either:

- the resulting increment of the meter register value over a measured period of time, or
- the resulting accumulation of pulses from the load over a measured period of time.

Prior to this change there was no specified minimum load requirement, and the ATH was not required to record the increment of the meter register value or the resulting accumulation of pulses. All of the records checked were for certifications that took place after 1st February 2021.

The metering installation certification reports included details of the load at the time of the test, the resulting accumulation of pulses and time taken. The minimum load requirements were not met for one of 67 installations. ICP 0000511359WE36F has a 100A whole current meter and the load did not meet 5A or 5%. It appears a 1.0 kW load may have been added rather than a 2.0 kW load. This installation has now been recertified using a load of more than 5%.

The ATH must also ensure that the change in the meter register that occurs when conducting a raw meter data test is at least "1" in the least significant digit, or one mark if the least significant digit does not have numerical markings. Wells records the meter register advance in the metering installation certification report. My checks confirmed that the meter had advanced by at least "1" in the least significant digit.

The previous audit report recorded that the two examples where the register had not advanced were Elster gRex meters owned by the Intellihub Limited MEP. These meters do not have any decimals places in the meter register, so the least significant digit is 1 kWh. This matter is now resolved following a memo to the industry from the Authority on 29 October 2021 confirming that if the LCD and the pulse output are both programmatically integrated, then the pulse can be used to confirm the register will advance.

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

- comparing the output from a working standard to the raw meter data from the metering installation for a minimum of one trading period, or

- confirming that the metering equipment provider's back-office processes include a comparison of the difference in the increment of the meter registers to the half-hour metering raw meter data, if the raw meter data is to be used for the purposes of Part 15.

Wells compares the output from a working standard to the raw meter data from the metering installation for a minimum of one trading period for category 2 installations, the results are recorded in the metering installation certification report. For category 1 installations Wells has received confirmation from the MEP that the comparison occurs.

Prevailing load tests must be conducted on a metering installation or metering component by using a working standard connected to the metering installation. Wells has conducted prevailing load tests in accordance with this clause using a working standard when conducting category 2 certifications.

Table 3 states that for Category 1 metering installations, where recertification occurs without meter replacement, a prevailing load test must be conducted using a working standard. I checked 10 ICPs with a certification duration of less than 15 years, and in all cases, a prevailing load test had not been conducted. If two meters were present the Code does not require a prevailing load test. The industry does not have a Category 1 prevailing load test capability and to establish one would cost approx. $12,500,000 just for the working standards, then each job would take longer, which would also add to costs. I've raised this as an issue for the Authority to consider.

Issue	Description	Remedial action
Category 1 prevailing load tests	Table 3 states that for Category 1 metering installations, where recertification occurs without meter replacement, a prevailing load test must be conducted using a working standard. The industry does not have a Category 1 prevailing load test capability and to establish one would cost approx. $12,500,000 just for the working standards, then each job would take longer, which would also add to costs.	I recommend the Authority changes the Code to allow recertification of single meter Category 1 installations with a raw meter data output test but not a prevailing load test.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.12 With: Clause 9(1) of Schedule 10.7 From: 01-Apr-21 To: 17-Apr-22	Minimum load of 5% was not applied for ICP 0000511359WE36F. At least 10 Category 1 metering installations recertified without a prevailing load test. Potential impact: Low Actual impact: Low Audit history: Once Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as strong because they mitigate risk to an acceptable level. The impact is negligible for the ICP certified with less than 5% load. There is no impact of not doing a prevailing load test, because raw meter data output tests are conducted.

Actions taken to resolve the issue	Completion date	Remedial action status
The installation will be revisited and the Meter Function test repeated at a load greater than 5% Acknowledged but disputed due to industry acknowledged code error	30-6-2022 -	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional Training is being provided via weekly Metering Reminders with some having already been given since the audit. -Photochecker Training and Check-points are being reviewed. -Options for automated Datachecking being investigated As discussed during the audit, the EA have been contacted regarding this apparent error. MEPs have been contacted and all agree that there is an error and that they do not require Wells ATH to perform a Prevailing Load Test in these circumstances	31-5-2022 31-5-2022 30-6-2022 -	

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

Code related audit information

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

a) obtain the raw meter data from the back-office system where the raw meter data is held; or

b) ensure that the metering equipment provider responsible for the metering installation has a process to validate a meter reading taken at the time of the metering installation certification with a meter reading from the metering equipment provider's back-office system.

Audit observation

I checked process documentation and 67 certification reports to confirm compliance.

Audit commentary

Wells has a letter from relevant MEPs confirming that they have a back-office validation process.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 67 certification reports to confirm whether Wells conducts this test.

Audit commentary

Wells uses pulse outputs or meter registers for testing.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation and records for 67 metering installations to confirm compliance.

Audit commentary

The records checked confirmed that the test results were within the accuracy tolerances set out in Table 1 of Schedule 10.1.

Audit outcome

Compliant

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

Code related audit information

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

- a metering component did not pass all the tests

- the metering installation did not meet the requirements for certification.

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

Audit observation

I checked process documentation and records for 67 metering installations to confirm compliance, and I also checked a database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes.

Audit commentary

As recorded in **sections 5.1** and **5.40**, there were 68 metering installations that do not meet the requirements for certification because the in-service burden is lower than the burden range of the CTs. less than the lowest test point.

Section 5.1 records that two ICPs have absolute errors (including uncertainty) greater than the combined class of the components. ICP 0000120467UND7C has an error of 2.24%. The CTs are class 1, and the meter is class 1, which means the CTs or the meter are recording outside their class. The other possibility is that there is an additional uncertainty component recorded, possibly in relation to using readings from the registers to conduct the prevailing load test rather than pulse outputs. ICP 0000604141UNEE5 has an absolute error of 2.3%. Once again, the components are class 1. The comments above are also valid for this ICP. In both cases, whilst the minimum load level was achieved, the load was quite low and testing over a longer period may have led to a more accurate result.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.16 With: Clause 10(1) & (2) of Schedule 10.7 From: 01-Apr-21 To: 17-Apr-22	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	At the time of the audit the controls were weak because they were insufficient to identify examples of non-compliant metering installations. Following the audit, the document called "Photo Checking Actions – Cat-1 & Cat-2" was updated to include checks of low burden and errors outside the combined class error of the components. I have therefore recorded the controls as moderate, and their effectiveness will be checked during the next audit. A presentation by the Electricity Authority in April 2019 indicated the total cost to a consumer over the 10-year certification where CTs were under burdened was between $3,200 and $9,200. This assumption was based on over recording of 1.0%, but more recent information suggests over recording of 0.5% is a more reasonable assumption. Therefore, the total cost to consumers for the 68 ICPs identified could be between $88,000 and $253,000. I have therefore concluded the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
Installations with low burden have been identified, the MEPs advised by email. Revisits for re-testing and burden resistor installation if required are now being planned. Installations with error greater than class sum have been identified, the MEPs advised by email. Revisits for re-testing are now being planned.	Completed 31-7-2022 Completed 31-7-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated Validation is in the workflows to prevent a job from progressing when error is greater than class sum, however these two jobs were created before that validation was added last year.	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022 Completed	

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

Code related audit information

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

Audit observation

I checked process documentation and records for 30 metering installations to confirm compliance.

Audit commentary

All 30 installations complied with the component specifications of Table 1.

Audit outcome

Compliant

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

Code related audit information

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

- the required tests in Table 3 of Schedule 10.1 are carried out

- each data storage device, meter, and measuring transformer has been calibrated and certified

- each data storage device is certified in accordance with clause 5 of Schedule 10.8

- the ATH provides a certification report for the metering installation.

Audit observation

I checked process documentation and records for 30 metering installations to confirm compliance.

Audit commentary

Wells provided certification reports for 30 installations certified using the selected component method. 18 of 20 Category 2 ICPs with selected component certification did not have all of the required tests in Table 3 of Schedule 10.1 completed. Measuring transformers were recorded as certified but calibration tests were not conducted. I filtered the spreadsheet provided for Category 2 certifications for AMS, Counties and Influx and found 306 of 433 ICPs with selected component certification applied had a "field outcome" indicating that CTs were not replaced, for example "BAU Deployment", "Tariff change" and "AES install and CT test".

ICPs 0007196846RNC92 and 0007190809RN429 had meters recertified without calibration being conducted.

ICP 0006475345RN7AB had a whole current meter present as well as Category 2 metering. The whole current meter (208137248) was recertified without calibration.

As recorded in **section 5.12**, 10 Category 1 metering installations were recertified without prevailing load tests being conducted. These 10 installations also had the meters recertified without calibration occurring.

I have recorded non-compliance as the tests were not completed.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.18 With: Clause 11(4) of Schedule 10.7 From: 01-Apr-21 To: 17-Apr-22	Calibration not conducted when CTs certified for up to 324 Category 2 metering installations certified using the selected component method. ICPs 0007196846RNC92 and 0007190809RN429 had meters recertified without calibration being conducted. Meters certified without calibration for at least 10 Category 1 installations recertified with existing meters. Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because certification tests are completed in most cases. The impact is likely to be low as certification tests had been carried out on the meters during previous certifications; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
- Records for the listed installations have been corrected and the MEPs advised by email. - Further investigations into what additional installations might be affected will be conducted and records for the additional installations will be corrected and the MEPs advised by email. - The installations will be revisited to have superseded sticker(s) removed. Acknowledged but disputed due to industry acknowledged code error	Completed 30-6-2022 31-7-2022 -	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated As discussed during the audit, the EA have been contacted regarding this apparent error. MEPs have been contacted and all agree that there is an error and that they do not require Wells ATH to perform a Prevailing Load Test in these circumstances	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022 -	

5.19 Comparative Recertification – Circumstances where method may be used (Clause 12(2) of Schedule 10.7)

Code related audit information

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

- the certification of the current transformers in the metering installation expires before the meter certification expiry date

- each data storage device and/or meter has been calibrated and certified.

Audit observation

I checked process documentation and records for 29 metering installations to confirm compliance.

Audit commentary

The process documentation is clear, and the metering installation certification reports for all 29 records contained confirmation the meter was replaced by another certified meter and the

certification of the current transformers in the metering installation expired before the meter certification expiry date.

Audit outcome

Compliant

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

Code related audit information

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

- the metering installation has passed the tests set out in Table 3 of Schedule 10.1 using a working standard

- the accuracy of the current measurement sensor (current transformer or high accuracy Rogowski coil) enables the metering installation to meet the specified accuracy requirements of Table 1 of Schedule 10.1

- the overall metering installation accuracy meets the requirements of Table 1 of Schedule 10.1 and

- the ATH provides a certification report for the metering installation.

Audit observation

I checked process documentation and records for 29 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

- by carrying out the tests set out in Table 4 of Schedule 10.1

- if each of the components (the data storage device, meter, and measuring transformer) has been calibrated and certified.

Audit observation

Wells does not conduct certification under this clause.

Audit commentary

Wells does not conduct certification under this clause.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells does not conduct certification under this clause.

Audit commentary

Wells does not conduct certification under this clause.

Audit outcome

Not applicable

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

Code related audit information

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

- the ATH has checked the design report of the metering installation to confirm the metering installation functions in accordance with the report

- the overall metering installation accuracy meets the requirements of Table 1 of Schedule 10.1

- the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation

- each metering component in the metering installation is used only in a permitted combination as set out in table 1 of Schedule 10.1.

Audit observation

Wells does not conduct certification under this clause.

Audit commentary

Wells does not conduct certification under this clause.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells does not conduct certification under this clause.

Audit commentary

Wells does not conduct certification under this clause.

Audit outcome

Not applicable

5.25 Insufficient Load (Clause 14 of Schedule 10.7)

Code related audit information

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

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

- it performs an additional integrity check of the metering installation wiring, and records the results of this check in the certification report

- it records in the certification report that the metering installation is certified under clause 14 of Schedule 10.7.

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

- update the metering installation certification report, within five business days of completing the tests, to include the results of the tests carried out

- leave the original metering installation certification expiry date unchanged.

Audit observation

Wells has not conducted insufficient load certification.

Audit commentary

Wells has not conducted insufficient load certification. The Wells process requires technicians to add load to ensure testing can be conducted.

Audit outcome

Not applicable

5.26 Statistical Sampling (Clause 16 of Schedule 10.7)

Code related audit information

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

- detailed in AS/NZS1284 (or approved and published by the Authority)

- recertify the group by recertifying each metering installation in the sample using the fully calibrated certification method

- advise the MEP as soon as reasonably practicable whether the sample passes or fails the recertification requirements.

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

- the process it follows for selecting samples

- any assumptions about those samples

- the metering installations in the sample

- the metering installations in the recertified group.

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

Audit observation

Wells has not conducted statistical certification.

Audit commentary

Wells has not conducted statistical certification.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells has not conducted statistical certification.

Audit commentary

Wells has not conducted statistical certification.

Audit outcome

Not applicable

5.28 Certification Validity Periods (Clause 17 of Schedule 10.7)

Code related audit information

A metering installation certification expiry date is the earliest of:

a) the date of commissioning plus the maximum certification validity period for the relevant category of metering installation, as set out in Table 1 of Schedule 10.1; or

b) the earliest metering component certification expiry date; or

c) a date determined by the ATH if the ATH believes that the circumstances and condition of the components in a metering installation warrant deviation from Table 1 of Schedule 10.1.

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

Audit observation

I checked 67 metering installation certification records to confirm compliance.

Audit commentary

The commissioning date and expiry date is calculated and recorded correctly in the metering installation certification reports for all 67 installations.

Audit outcome

Compliant

5.29 Metering Installation Accuracy (Clause 21 of Schedule 10.7)

Code related audit information

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

Audit observation

I checked 67 metering installation certification records to confirm compliance.

Audit commentary

The Wells comparative recertification workflows ensure that installations are not certified if the uncertainty is greater than 0.6% or the overall error and uncertainty exceeds the requirements of Table 1 of Schedule 10.1. The error and uncertainty is recorded on the certification reports.

The error and uncertainty processes are discussed in more detail in **section 5.30**.

Audit outcome

Compliant

5.30 Error Calculation (Clause 22 of Schedule 10.7)

Code related audit information

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

- all sources of measurement error including test instrument errors, reference standard variations when used in conditions that deviate from those in the calibration report, variations in repeated observations, the instrument resolution or discrimination threshold and any assumptions incorporated in the measurement method and procedure

- the error calculation must include the uncertainty in the measurement at a 95% level of confidence using JCGM 100:2008

- the error and its calculation must be recorded in the certification report.

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

Audit observation

I checked 29 metering installation certification records and discussed the process for error calculation.

Audit commentary

Wells conducts comparative recertification tests using a working standard as required by this clause. The error and uncertainty results are recorded in the metering installation certification report. The workflow prevents the technician from completing certification if the uncertainty is greater than 0.6%.

Wells has considered the sources of uncertainty and included the influence of ambient temperature on the accuracy of the Hioki working standard. Ambient temperature is measured and recorded by the technician on-site. The uncertainty calculation includes an allowance based on the difference between the calibrated temperature of the working standard to the ambient temperature based on the temperature drift specification of the device. This influence is also added as an absolute figure to the overall error measurement. It appears that the influence of the ambient temperature is being applied twice. I repeat the recommendation from the last audit that Wells review the application of the ambient temperature influence to determine if the adjustment of the overall error figure is necessary.

The comparative recertification process includes a comparison between the meter register and the Hioki working standard. The technician starts and stops the Hioki by pushing a button when the least significant digit on the meter registers advances. The uncertainty process does not include any potential error introduced by the reaction time of the technician when pushing the button. I repeat the recommendation from the previous audit that Wells investigate the possibility of using pulses from the meter or determine and add an allowance in the uncertainty calculation for the influence of the reaction time.

An additional recommendation is that the certification report is changed to record uncertainty as one figure rather than having separate uncertainties for the working standard and for temperature. It is preferable that errors are recorded as follows:

Measured error	X 1%
Uncertainty	X 2%
Total error including uncertainty	=X1 + X2

Recommendation	Description	Audited party comment	Remedial action
Regarding 22 of Schedule 10.7	Regarding the comparative recertification error and uncertainty calculation process – record the error an uncertainty as single figures. Measured error, plus uncertainty = total error.	The calculation steps will be reviewed with a view to displaying these intermediate values	Identified

Wells has done some investigations into the two recommendations and is seeking advice from MSL.

Recommendation	Description	Audited party comment	Remedial action
Regarding 22 of Schedule 10.7	Regarding the comparative recertification error and uncertainty calculation process - review the application of the ambient temperature influence to determine if the adjustment of the overall error figure is necessary.	The application of temperature drift will be reviewed	Investigating

Recommendation	Description	Audited party comment	Remedial action
Regarding 22 of Schedule 10.7	Regarding the comparative recertification error and uncertainty calculation process - investigate the possibility of using pulses from the meter or determine and add an allowance in the uncertainty calculation for the influence of the reaction time.	The feasibility of pulse counting will be investigated, and the previous communication with MSL on reaction time uncertainty followed-up	Investigating

Audit outcome

Compliant

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

Code related audit information

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

- advise the MEP of the compensation factor

- ensure that the compensation factor that will be applied to raw meter data external to the metering installation is applied as follows:

a) for ratio compensation, on a category 1 metering installation or higher category of metering installation; or

b) for error compensation, on a metering installation that quantifies electricity conveyed through a point of connection to the grid; or

c) for loss compensation, only on a category 3 or higher metering installation.

Audit observation

I checked 67 metering installation certification records, and process documentation.

Audit commentary

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

ICP 0000616050WPE6E had a compensation factor of "1" recorded in the "SET DEFAULT ANSWERS" section as shown below. Other sections of the report contained the correct compensation factor, but the MEP and the trader used "1". The MEP has now notified the trader of the correct compensation factor and the registry has been corrected.

SET DEFAULT ANSWERS	Completed: 16 Jun 2021 11:33
Set Defaults	Yes
---------- EIPC Defaults ----------	
Site ATH	WELLS
Generation Legacy	Legacy
Generation Advanced	Advanced
Phase WC	1
Phase CT	3
Multiplier	1
Energy Flow Direction	Exit
Meter Validity Period	15
SA Interface	Remote
Cert Date	16/06/2021
Cert Method	Selected Component
Expiry Date	16/06/2031

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.31 With: 24(1)(b) of Schedule 10.7 From: 16-Jun-21 To: 25-Jan-22	Incorrect compensation factor recorded for ICP 0000616050WPE6E. Potential impact: High Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**

Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Unclear what, if any, actions can resolve the current situation since it is now historic and the MEP data has already been corrected.	-	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
It is apparently not straightforward to omit the "Set Default Answers" task from the certification report, but a warning label can be added to all workflows to highlight that the default answers do not form part of the certification report.	31-5-2022	

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

Code related audit information

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

Audit observation

I checked 67 metering installation certification records, and process documentation.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

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

Audit commentary

This clause is designed to allow switchboard manufacturers to install measuring transformers in switchboards at the time of manufacture. This clause does not allow the installation of meters or data loggers. Wells has a documented process to ensure compliance with this clause. There were no specific examples to examine during the audit.

Audit outcome

Compliant

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

Code related audit information

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

a) the maximum metering installation certification validity period for the relevant category of metering installation; or

b) the maximum meter certification validity period set out in Table 2 of Schedule 10.1 for the relevant class of meter for the metering installation; or

c) the certification period specified in the meter certification report.

Audit observation

I checked 67 certification records to confirm compliance.

Audit commentary

The commissioning date and expiry date is calculated and recorded correctly in the metering installation certification reports for all 67 installations.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 67 certification records to confirm compliance.

Audit commentary

Wells understands the requirements of this clause and ensures that all meters are certified at the time of installation.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked 53 certification records to confirm compliance.

Audit commentary

All of the installations had measuring transformers that had been certified.

Audit outcome

Compliant

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

Code related audit information

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

- the installation has certified measuring transformers

- the installation has a test facility which has provision for isolation, installed as physically close to the meter as practical in the circumstances

- the test facility is fitted with a transparent cover

- the installation has securely mounted measuring transformers which are, if practicable, in a sealed enclosure

- the maximum permitted error is calculated in accordance with clause 22 for the fully calibrated certification method or the comparative recertification method

- any voltage supplies from a voltage transformer to a meter or that other equipment in the metering installation is protected by appropriately rated fuses or circuit breakers dedicated to the supply. All fuses and circuit breakers must be suitably sealed or located in sealed enclosures,

- the measuring transformer's secondary circuit is earthed and that it is earthed at no more than one point

- the total in-service burden (magnitude and phase angle, where appropriate), complies with clause 31.

Audit observation

I checked 53 certification records to confirm compliance.

Audit commentary

The certification reports confirmed compliance with regard to all of the above points with the exception of the total in-service burden requirements. Clause 31 of schedule 7 was changed from 1st February 2021 to require the ATH to ensure that the in-service burden is within the burden range of the measuring transformers.

My checks of 53 category 2 metering installation certification reports found seven of the reports had in-service burden lower than the burden range of the CTs, the table below shows details of the seven installations,

ICP	MEP	Certification date	CT Ratio	Rated burden	Burden range VA	Lowest in-service burden	Burden resistors added
0000130662UN2D5	NGCM	26/07/2021	100/5	10VA	2.5-10VA	1.71	Yes
0006475345RN7AB	NGCM	3/09/2021	300/5	5VA	1.25-5VA	0.04	No
0000452438WT26B	NGCM	27/01/2022	200/5	5VA	1.25-5VA	0.41	No
0015708565EL7DE	FCLM	3/08/2021	200/5	5VA	1.25-5VA	0.53	No
0000616050WPE6E	FCLM	16/06/2021	300/5	5VA	1.25-5VA	1.12	No
0001241205PN7EB	FCLM	5/05/2021	250/5	5VA	1.25-5VA	0.62	No
0003124120WF602	FCLM	5/05/2021	200/5	5VA	1.25-5VA	0.63	No

Analysis of database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes found an additional 48 of 372 (13%) installations had low burden and burden resistors were not added. These installations do not comply with Part 10 and should not have been certified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.37 With: Clause 28(4) Of Schedule 10.7 From: 01-Apr-21 To: 18-Apr-22	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	At the time of the audit the controls were weak because they were insufficient to identify examples of non-compliant metering installations. Following the audit, the document called "Photo Checking Actions – Cat-1 & Cat-2" was updated to include checks of low burden and errors outside the combined class error of the components. I have therefore recorded the controls as moderate, and their effectiveness will be checked during the next audit. A presentation by the Electricity Authority in April 2019 indicated the total cost to a consumer over the 10-year certification where CTs were under burdened was between $3,200 and $9,200. This assumption was based on over recording of 1.0%, but more recent information suggests over recording of 0.5% is a more reasonable assumption. Therefore, the total cost to consumers for the 68 ICPs identified could be between $108,800 and $312,800, or $10,880 to $31,280 per annum. There is also an impact on five MEPs because certification is cancelled for these installations, and this can have an impact their compliance and potentially their audit frequency. I have therefore concluded the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
Installations with low burden have been identified, the MEPs advised by email. Revisits for re-testing and burden resistor installation if required are now being planned.	Completed 31-7-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

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

Code related audit information

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

Audit observation

I checked 20 category 2 selected component certification records to confirm compliance.

Audit commentary

The current transformer certification expiry date is calculated and recorded correctly in the metering installation certification reports for all 20 installations.

18 installations had CTs certified without calibration, which is recorded as non-compliance in **section 5.67.**

Audit outcome

Compliant

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

Code related audit information

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

- the meters are included in the metering installation being certified

- appropriate fuses or circuit breakers are provided to protect the metering circuit from short circuits or overloads affecting the other meter.

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

- the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation category

- the metering installation certification report confirms that the accuracy of the metering installation remains within the maximum permitted error for the relevant metering installation

- any wiring between the equipment and any part of the metering installation is continuous

- the equipment is labelled appropriately, including with any de-energisation restrictions

- the connection details of the other equipment are recorded in the metering installation design report

- there are appropriate fuses or circuit breakers provided to protect the voltage transformer and metering circuit from short circuits or overloads affecting the other equipment.

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

5.40 Burden & Compensation (Clause 31 of Schedule 10.7)

Code related audit information

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

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

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

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

Before it certifies a metering installation incorporating a measuring transformer:

- *ensure that the in-service burden does not exceed the upper limit of the range specified for the measuring transformer, if specified in the design report for the metering installation.*
- *ensure that the in-service burden on the measuring transformer is within the range specified in the certification report by installing burdening resistors, if necessary,*
- *confirm that a class A ATH has confirmed by calibration that the accuracy of the measuring transformer will not be adversely affect by the in-service burden being less than the lowest*

burden test point specified in the standard, if the primary voltage of the measuring transformer is greater than 1kV,

- *confirm that the measuring transformer's manufacturer has confirmed that the accuracy of the measuring transformer will not be adversely affected by the in-service burden being less than the lowest burden test point specified in the standard.*

Audit observation

I checked processes and the records for 42 category 2 metering installations to confirm compliance.

Audit commentary

The certification reports and process documentation confirmed compliance with regard to all of the above points with the exception of the total in-service burden requirements.

My checks of 53 category 2 metering installation certification reports found seven of the reports had in-service burden lower than the burden range of the CTs, the table below shows details of the seven installations,

ICP	MEP	Certification date	CT Ratio	Rated burden	Burden range VA	Lowest in-service burden	Burden resistors added
0000130662UN2D5	NGCM	26/07/2021	100/5	10VA	2.5-10VA	1.71	Yes but insufficient to meet 25% of rated burden
0006475345RN7AB	NGCM	3/09/2021	300/5	5VA	1.25-5VA	0.04	No
0000452438WT26B	NGCM	27/01/2022	200/5	5VA	1.25-5VA	0.41	No
0015708565EL7DE	FCLM	3/08/2021	200/5	5VA	1.25-5VA	0.53	No
0000616050WPE6E	FCLM	16/06/2021	300/5	5VA	1.25-5VA	1.12	No
0001241205PN7EB	FCLM	5/05/2021	250/5	5VA	1.25-5VA	0.62	No
0003124120WF602	FCLM	5/05/2021	200/5	5VA	1.25-5VA	0.63	No

Analysis of database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes found an additional 48 of 372 (13%) installations had low burden and burden resistors were not added. These installations do not comply with Part 10 and should not have been certified.

Wells conducted further analysis of burden values in their database following the audit, and identified three ICPs where burden resistors had been added but the corrected burden was higher than the rated burden. Recertification will be required to adjust the burden to be within the burden range. The ICPs are 1000570896PC9C0, 0000840185WE342 and 0087050078WE3ED.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.40 With: Clause 31 Of Schedule 10.7 From: 01-Apr-21 To: 18-Apr-22	At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs. Three ICPs with burden higher than the rated burden. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	At the time of the audit the controls were weak because they were insufficient to identify examples of non-compliant metering installations. Following the audit, the document called "Photo Checking Actions – Cat-1 & Cat-2" was updated to include checks of low burden and errors outside the combined class error of the components. I have therefore recorded the controls as moderate, and their effectiveness will be checked during the next audit. A presentation by the Electricity Authority in April 2019 indicated the total cost to a consumer over the 10-year certification where CTs were under burdened was between $3,200 and $9,200. This assumption was based on over recording of 1.0%, but more recent information suggests over recording of 0.5% is a more reasonable assumption. Therefore, the total cost to consumers for the 68 ICPs identified could be between $108,800 and $312,800, or $10,880 to $31,280 per annum. There is also an impact on five MEPs because certification is cancelled for these installations, and this can have an impact their compliance and potentially their audit frequency. I have therefore concluded the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
Installations with low burden have been identified, the MEPs advised by email. Revisits for re-testing and burden resistor installation if required are now being planned.	Completed 31-7-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

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

Code related audit information

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

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

- the ATH is satisfied that the metering installation will comply with the applicable accuracy requirements

- the ATH has advised the MEP that the metering installation has been certified by this method

- the MEP has advised the registry of the certification.

Audit observation

I checked the process documentation and whether any examples had occurred.

Audit commentary

Wells has not applied alternative certification, but the process documentation is compliant.

Audit outcome

Compliant

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

Code related audit information

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

- that the certification expiry date for each control device is the same as the metering installation certification expiry date and record that date in the installation certification report

- that the control device complies with the applicable standards listed in Table 5 of Schedule 10.1

- the control device is fit for purpose

- if the metering installation contains a control device that has previously been used in another metering installation, that the control device is still fit for service.

- that the control device is:

a) likely to receive control signals

b) correctly connected

c) correctly programmed.

Audit observation

I checked certification records for 14 metering installations to confirm compliance.

Audit commentary

Wells is certifying control devices and correctly applying stickers. The control device certification expiry date is correctly recorded in the installation certification report. MEPs have stated in writing that there are no signal propagation issues they are aware of.

All points above are met.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

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

Audit commentary

Wells has appropriate fields in the metering installation certification report to confirm compliance with this clause. Wells checked with all MEPs whether there were any known control signal issues they needed to be aware of, and it was confirmed there were no areas in this category.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked processes and the records for 67 metering installations to confirm compliance.

Audit commentary

All data storage devices are recertified prior to being reinstalled.

Audit outcome

Compliant

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

Code related audit information

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

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

- has a dedicated power supply unless the data storage device is integrated with another metering component

- is compatible with each other metering component of the metering installation

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

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

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

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

- has memory capacity and functionality that is suitable for the proposed functions of the data storage device specified in the design report for the metering installation

- has availability of memory for a period that is suitable for the proposed functions as set out in the design report for the metering installation, and at least for a minimum continuous period of 15 days.

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

a) loss of power supply

b) critical internal alarms

c) meter phase failure if integral to the meter

d) software configuration changes

e) a record of time changes.

Audit observation

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

Audit commentary

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. Wells is ensuring data storage devices are certified and the maximum interrogation cycle is recorded.

I recommend in **section 4.12** that Wells develops a type test report schedule, listing all type test reports with confirmation that the items above have been checked and confirmed. Each record should have the date the checks were performed and details of who conducted the checks. The requirements of this clause should be part of the schedule.

Audit outcome

Compliant

5.46 Location of Metering Installation Certification Stickers (Clause 41(1) and 41(9) of Schedule 10.7)

Code related audit information

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

When attaching a metering installation certification sticker, the ATH must remove or obscure any invalid or expired certification stickers.

Audit observation

I checked the photos for 67 metering installations to confirm compliance.

Audit commentary

In all cases, the certification stickers contained the appropriate detail and were correctly applied. Old certification stickers were removed for all but one installation. ICP 0007190809RN429 was recertified but the old sticker is still in place, as shown below.

In **sections 2.2** and **5.18**, I have recorded that 18 of 20 Category 2 ICPs with selected component certification did not have all of the required tests in Table 3 of Schedule 10.1 completed. Measuring transformers were recorded as certified but calibration tests were not conducted. I filtered the spreadsheet provided for Category 2 certifications for AMS, Counties and Influx and found 306 of 433 ICPs with selected component certification applied had a "field outcome" indicating that CTs were not replaced, for example "BAU Deployment", "Tariff change" and "AES install and CT test". All 18 installations mentioned above had CT certification stickers attached. These stickers are invalid because the CTs are not certified. Clause 41(9) requires that invalid certification stickers are removed "at the time the metering installation certification sticker is attached". It is not known whether the installation sticker was attached before or after the CT stickers, so I have not recorded non-compliance with this clause, however I recommend CT stickers are removed from all installations where they are invalid. Non-compliance is recorded in **section 2.2** regarding the accuracy of information.

Recommendation	Description	Audited party comment	Remedial action
CT certification stickers	Identify all invalid CT stickers and arrange for them to be removed from the relevant installations.	We will look into options for identifying superseded stickers and flagging them for removal as and when it is feasible to do so	Investigating

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.46 With: Clause 41(1) and 41(9) of Schedule 10.7 From: 20-Jul-21 To: 01-May-22	Old certification sticker not removed for one installation. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
- The installations will be revisited to have superseded sticker(s) removed.	31-7-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional training has been provided via weekly Metering Reminders. -Cat-2 Photochecker Training and Check-points are being reviewed. -We will look into options for identifying superseded stickers and flagging them for removal as and when it is feasible to do so	31-5-2022 31-5-2022 30-6-2022	

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

Code related audit information

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

Audit observation

I checked with Wells whether this scenario had arisen.

Audit commentary

This scenario has not arisen and is unlikely to arise.

Audit outcome

Compliant

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

Code related audit information

The metering installation certification sticker must show:

- the name of the ATH who certified the metering installation

- the certification date of the installation

- the metering installation category

- the ICP

- the certification number for the metering installation.

Audit observation

I checked the photos for 67 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

5.49 Combining certification stickers (Clause 41(5) – Clause 41(8) of Schedule 10.7)

Code related audit information

If an ATH certifies a metering component on the same day that the ATH certifies the metering installation, the ATH may combine the metering installation certification sticker with the metering component certification sticker.

If the certification sticker is combined, the ATH must:

- *ensure that the combined sticker shows all the information required by subclause (2) and clause 8(2) of Schedule 10.8,*

- *meet the requirements of subclauses (1), (3) and (4), as if the combined sticker were a metering installation certification sticker.*

The combined sticker is immediately invalid if:

- *the metering installation certification expiry date changes; or*

- *a metering component to which the combined certification sticker relates is removed from the metering installation.*

Audit observation

Wells has not used a combined metering installation and component sticker.

Audit commentary

Wells has not used a combined metering installation and component sticker.

Audit outcome

Compliant

5.50 Enclosures (Clause 42 of Schedule 10.7)

Code related audit information

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

Audit observation

I checked the photos for 67 metering installations to confirm compliance.

Audit commentary

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

The photos for 67 metering installations showed that all enclosures were appropriate for the environment, and the Wells certification sticker has an appropriate warning. Wells reviews photos of all installations to confirm enclosure suitability.

Wells has developed and implemented the use of a separate sticker for CT chambers. This was recommended in the last audit.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the processes for storage of components, and the records for 67 metering installations to confirm compliance.

Audit commentary

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

Wells has appropriate arrangements for storage and transportation, and they have letters on file from MEPs confirming that storage and transportation arrangements are appropriate from the factory to Wells.

Audit outcome

Compliant

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

Code related audit information

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

The metering components which must be sealed include:

- each part and connection of a data storage device in, or attached to, the metering installation except for a port for on-site reading that is not capable of carrying out any other function

- the main switch cover, if the main switch:

a) is on the supply side of the metering installation

b) has provision for sealing.

Audit observation

I checked process documentation, design reports and the photos for 67 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 67 metering installations confirm compliance.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and the photos for 67 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 67 metering installations confirm compliance. The warning label is installed in a prominent position.

Audit outcome

Compliant

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

Code related audit information

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

- the ATH who affixed the seal

- the person (or the sealing tool) who applied the seal

- when the seal was applied.

Audit observation

I checked process documentation, design reports and the photos for 67 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 67 metering installations confirm compliance. The certification records contain the relevant details required by this clause.

Audit outcome

Compliant

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

Code related audit information

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

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

Audit observation

I conducted a walkthrough of this process to confirm compliance.

Audit commentary

When a seal is discovered to be broken or missing there is a procedure to ensure the MEP is notified. Wells also has a procedure and instruction to notify the MEP if any issues are present due to broken or damaged seals. Wells records any seals they have broken as an ATH.

Audit outcome

Compliant

5.56 Wiring (Clause 6 of Schedule 10.8)

Code related audit information

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

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

- is run as directly as practicable

- is appropriately sized and protected

- does not, to the extent practicable, include intermediate joints for any measuring transformer circuits

- includes conductors that are clearly and permanently identified, by the use of any 1 or more of the following:

a) colour coding

b) marker ferrules

c) conductor numbering.

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

Audit observation

I checked process documentation, design reports and the photos for 67 metering installations to confirm compliance.

Audit commentary

The process documentation, design reports and the photos for 67 metering installations confirm compliance.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked design reports and the photos for 53 category 2 metering installations to confirm compliance.

Audit commentary

The checks demonstrated compliance with this requirement.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and 67 certification reports to confirm compliance.

Audit commentary

All certified components have calibration reports and stickers.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked process documentation, design reports and 67 certification reports to confirm compliance.

Audit commentary

All certified meters have calibration reports and stickers.

As recorded in **sections 2.2, 5.18** and **5.67**, there are up to 324 installations recorded as having selected component certification and certified CTs, where the CTs were not calibrated. This clause requires CTs to be calibrated before they are certified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.59 With: Clause 7(2) Of Schedule 10.4 From: 01-Apr-21 To: 18-Apr-22	Up to 324 sets of CTs certified without calibration. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact is low because prevailing load tests were conducted, and the installations are confirmed to be recording accurately.

Actions taken to resolve the issue	Completion date	Remedial action status
Investigations into identifying the installations will be conducted, records for the installations will be corrected and the MEPs advised by email.	30-6-2022	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
-Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

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

Code related audit information

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

Audit observation

The Wells Class B ATH does not calibrate components.

Audit commentary

The Wells Class B ATH does not calibrate components.

Audit outcome

Not applicable

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

Code related audit information

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

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

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

Audit observation

The Wells Class B ATH does not calibrate components.

Audit commentary

The Wells Class B ATH does not calibrate components.

Audit outcome

Not applicable

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

Code related audit information

An ATH must, when calibrating a metering component:

- if necessary, adjust and document the error compensation

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

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

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

Audit observation

The Wells Class B ATH does not calibrate components.

Audit commentary

The Wells Class B ATH does not calibrate components.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

The Wells Class B ATH does not calibrate components.

Audit commentary

The Wells Class B ATH does not calibrate components.

Audit outcome

Not applicable

5.64 Meter Certification (Clause 1 of Schedule 10.8)

Code related audit information

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

Audit observation

I checked the certification records for 67 metering installations to confirm compliance.

Audit commentary

My checks of 67 certification records confirmed that all meters were certified in 66 installations. Wells provided calibration reports for the meters certified in each certification record. I checked a folder containing copies of type test certificates for each meter type.

Meter number 208137248 at ICP 0006475345RN7AB is whole current and was certified and installed on 13 May 2010. It was not replaced when the associated category 2 meter was replaced but the installation was recertified for 10 years, and meter number 208137248 was recorded as certified, but it was not recalibrated.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.64 With: Clause 1 of Schedule 10.8 From: 03-Sep-21 To: 18-Apr-22	Meter number 208137248 at ICP 0006475345RN7AB was recorded as recertified but it does not have a calibration report and is therefore not certified. Potential impact: Medium Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status

Records for the installations will be corrected and the MEPs advised by email.	31-5-2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
-Additional training will be provided to the tech concerned. -Further related training will be provided via weekly Metering Reminders. -Photochecker Training and Check-points are being reviewed. -Options for automated datachecking being investigated	31-5-2022 30-6-2022 31-5-2022 30-6-2022	

5.65 Meter Requirements when Meter is Relocated (Clause 26(2) Of Schedule 10.7 and Clause 43(2) Of Schedule 10.7)

Code related audit information

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

Audit observation

I checked processes and the records for 67 metering installations to confirm compliance.

Audit commentary

Wells ensures that all meters are calibrated by a class A ATH prior to being reinstalled.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

Wells certifies CTs based on calibration reports provided by a Class A ATH.

Audit commentary

Wells certifies CTs based on calibration reports provided by a Class A ATH, which covers the points raised above.

Audit outcome

Compliant

5.67 Measuring Transformer Certification (Clause 3 of Schedule 10.8)

Code related audit information

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

- the measuring transformer has a current calibration report issued by an approved calibration laboratory or an ATH approved to carry out calibration

- the measuring transformer calibration report:

- confirms that the measuring transformer complies with the standards listed in Table 5 of Schedule 10.1

- records any tests the ATH has performed to confirm compliance

- confirms that the measuring transformer has passed the tests

- records any recommendations made by the ATH on error compensation

- includes any manufacturer's calibration test reports.

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

- the date on which it certified the measuring transformer

- the certification validity period for the measuring transformer, which must be no more than 120 months

- whether the certification was based on batch test certificates

- if the certification was based on batch test certificates, confirmation that the manufacturer's batch testing facility is, in the ATH's opinion, of an acceptable standard

- the range that the in-service burden must be within

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

Audit observation

I checked the Wells processes for certification of current transformers and the certification records for 53 category 2 metering installations.

Audit commentary

When conducting selected component certification of category 2 metering installations Wells certifies the CTs based on calibration reports provided by a Class A ATH, which covers the points raised above.

This clause was changed from 1st February 2021 to require the ATH to record the burden range of the measuring transformers in the transformer certification report. Two certification reports did not have a burden range recorded and two had an incorrect burden range of 1.25 to 5.0 for TWS 500/5 CTs which should be 0.0 to 5.0.

As recorded in **sections 2.2, 5.18** and **5.59**, there are up to 324 installations recorded as having selected component certification and certified CTs, where the CTs were not calibrated. This clause requires CTs to be calibrated before they are certified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.67 With: Clause 3 of Schedule 10.8 From: 01-Apr-21 To: 18-Apr-22	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for two category 2 metering installations. Up to 324 category 2 metering installations with CTs certified without calibration being carried out. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact is low because prevailing load tests were conducted, and the installations are confirmed to be recording accurately.

Actions taken to resolve the issue	Completion date	Remedial action status
Records for the installations have been corrected and the MEP advised by email. Investigations into identifying the installations will be conducted, records for the installations will be corrected and the MEPs advised by email.	Completed 30-6-2022	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
Workflows were modified after 1st Feb 2021 to cater for Burden Range recording. -Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	Completed 31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

5.68 Measuring Transformers in service burden range (Clause 2(1)(E) Of Schedule 10.8)

Code related audit information

Before certifying a measuring transformer, the ATH must determine the range that the in-service burden must be within to ensure the measuring transformer remains accurate, by using one or more of the following:

- *the measuring transformer's nameplate rating*
- *the calibration report for the measuring transformer*
- *the manufacturer's documentation for the measuring transformer*
- *the standard set out in Table 5 of Schedule 10.1 the measuring transformer was manufactured to.*

Audit observation

I checked 20 category 2 selected component certification records to confirm compliance.

Audit commentary

The requirement to determine the range that the in-service burden must be within to ensure the measuring transformer remains accurate was introduced on 1st February 2021.

This clause was changed from 1st February 2021 to require the ATH to record the burden range of the measuring transformers in the transformer certification report. Two certification reports did not have a burden range recorded and two had an incorrect burden range of 1.25 to 5.0 for TWS 500/5 CTs which should be 0.0 to 5.0.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.68 With: Clause 2(1)(E) Of Schedule 10.8 From: 01-Feb-21 To: 13-May-21	Burden range not recorded in CT certification reports for two metering installations. Incorrect burden ranges recorded for two category 2 metering installations. Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded that the controls are moderate as Wells has updated its processes to record burden ranges, but the range is not always correct. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Records for the installations have been corrected and the MEP advised by email.	Completed	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Workflows were modified after 1st Feb 2021 to cater for Burden Range recording. -Additional Cat-2 Training is being provided via weekly Metering Reminders with some having already been given since the audit. -An initial Cat-2 Teams Training session has been held this week. -Cat-2 Photochecker Training and Check-points are being reviewed. -Cat-2 Photochecker actions document has been amended to include additional Check-points. -Additional new Cat-2 Datachecking being put in place. -Options for automated Datachecking being investigated	Completed 31-5-2022 Completed 31-5-2022 Completed 31-5-2022 30-6-2022	

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

Code related audit information

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

Audit observation

I checked the policy regarding epoxy CTs.

Audit commentary

Epoxy insulated CTs are discarded upon discovery.

Audit outcome

Compliant

5.70 Control Device Certification (Clause 4 of Schedule 10.8)

Code related audit information

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

- confirms that the control device complies with the applicable standards listed in Table 5 of Schedule 10.1

- includes the details and results of any test that the ATH has carried out to confirm compliance under paragraph (a)

- confirms that the control device has passed such tests.

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

- that the control device is fit for purpose

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

Audit observation

I checked the certification records for 14 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the certification records for 67 metering installations and the process documentation to confirm compliance.

Audit commentary

All data storage devices are integrated with the meters and are recalibrated prior to being reinstalled.

Audit outcome

Compliant

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

Code related audit information

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

- the effects of any departures from the reference conditions can accurately and reliably be calculated

- the metering installation, in which the metering component is incorporated, is within the applicable accuracy tolerances set out in Table 1 of Schedule 10.1 after taking into account all known influences including temperature and temperature co-efficient measurements.

Audit observation

Wells does not conduct onsite calibration of metering components.

Audit commentary

Wells does not conduct onsite calibration of metering components.

Audit outcome

Not applicable

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

Code related audit information

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

- is documented in the ATH's procedures

- can manipulate the variables that affect the performance of the metering component in a manner that will produce results that would correctly indicate the level of compliance of the metering component with this Code.

Audit observation

Wells does not conduct onsite calibration of metering components.

Audit commentary

Wells does not conduct onsite calibration of metering components.

Audit outcome

Not applicable

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

Code related audit information

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

- it has calculated the uncertainty of measurement taking into account all environmental factors for both the metering component being calibrated and the working standards

- the calculation of the uncertainty comprises all uncertainties in the chain of calibration

- the ATH has used a calibration procedure to calibrate the metering component that was included in the ATH's most recent audit and is appropriate for on-site calibration.

Audit observation

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

Audit commentary

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

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

I checked the records for 67 metering installations to confirm compliance.

Audit commentary

All data storage devices are integrated with the meters and in all cases the data storage devices expiry date is the same as the meter and is recorded in the certification report.

Audit outcome

Compliant

5.76 All Functions and Activities must be Completed (Clause 10.42(2))

Code related audit information

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

Audit observation

I checked the records for 67 metering installations to confirm compliance.

Audit commentary

There was no evidence of incomplete functions.

Audit outcome

Compliant

6. INSPECTION OF METERING INSTALLATIONS

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

Code related audit information

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

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

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

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

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

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

Audit observation

Wells has not conducted any inspections in the audit period.

Audit commentary

Wells has not conducted any inspections in the audit period.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells has not conducted any inspections in the audit period.

Audit commentary

Wells has not conducted any inspections in the audit period.

Audit outcome

Not applicable

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

Code related audit information

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

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

- the serial numbers of all components in the metering installation

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

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

Audit observation

Wells has not conducted any inspections in the audit period.

Audit commentary

Wells has not conducted any inspections in the audit period.

Audit outcome

Not applicable

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

Code related audit information

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

Audit observation

Wells has not conducted any inspections in the audit period.

Audit commentary

Wells has not conducted any inspections in the audit period.

Audit outcome

Not applicable

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

Code related audit information

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

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

- if the current transformer can be safely accessed, check the position of the current transformer tap to ensure it is still appropriate for the expected maximum current for the metering installation

- check for the presence of appropriate voltages at the metering installation

- check the voltage circuit alarms and fault indicators.

Audit observation

Wells has not conducted any Category 2 or above inspections in the audit period.

Audit commentary

Wells has not conducted any Category 2 or above inspections in the audit period.

Audit outcome

Not applicable

7. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

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

Code related audit information

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

Audit observation

I checked Wells' process documentation and four examples of faulty metering installation investigations to confirm compliance. I also checked the content of this report for any examples of metering installations that were faulty, inaccurate, defective, or not fit for purpose.

Audit commentary

Wells has a process which is compliant with the Code. Four examples where faulty meters were replaced, and the metering installations recertified were examined. The certification reports contain sufficient information to report to the MEP.

As recorded in **section 5.1**, my checks of 53 category 2 metering installation certification reports found seven of the reports had in-service burden lower than the burden range of the CTs, the table below shows details of the seven installations,

ICP	MEP	Certification date	CT Ratio	Rated burden	Burden range VA	Lowest in-service burden	Burden resistors added
0000130662UN2D5	NGCM	26/07/2021	100/5	10VA	2.5-10VA	1.71	Yes but insufficient to meet 25% of rated burden.
0006475345RN7AB	NGCM	3/09/2021	300/5	5VA	1.25-5VA	0.04	No
0000452438WT26B	NGCM	27/01/2022	200/5	5VA	1.25-5VA	0.41	No
0015708565EL7DE	FCLM	3/08/2021	200/5	5VA	1.25-5VA	0.53	No
0000616050WPE6E	FCLM	16/06/2021	300/5	5VA	1.25-5VA	1.12	No
0001241205PN7EB	FCLM	5/05/2021	250/5	5VA	1.25-5VA	0.62	No
0003124120WF602	FCLM	5/05/2021	200/5	5VA	1.25-5VA	0.63	No

Analysis of database extract for the audit period for the MTRX, FCLM, COUP and NGCM MEP codes found an additional 48 of 372 (13%) installations had low burden and burden resistors were not added. These installations do not comply with Part 10 and should not have been certified.

Two ICPs have absolute errors (including uncertainty) greater than the combined class of the components. ICP 0000120467UND7C has an error of 2.24%. The CTs are class 1, and the meter is class 1, which means the CTs or the meter are recording outside their class. The other possibility is that there is an additional uncertainty component recorded, possibly in relation to using readings from the registers to conduct the prevailing load test rather than pulse outputs. ICP 0000604141UNEE5 has an absolute error of 2.3%. Once again, the components are class 1. The comments above are also valid for this ICP. In both cases, whilst the minimum load level was achieved, the load was quite low and testing over a longer period may have led to a more accurate result.

This clause requires Wells to notify the relevant MEPs that the installations mentioned in this section are either inaccurate, defective or not fit for purpose. This clause does not mention a specific timeframe; therefore, I have applied the timeframe mentioned in Clause 10.6, which is "as soon as practicable". Wells notified all relevant MEPs on 04/05/2022, which achieves compliance with this clause.

Audit outcome

Compliant

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

Code related audit information

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

Audit observation

I checked the results of the process followed for four examples of faulty metering installations.

Audit commentary

In all four cases, appropriate testing and reporting was conducted immediately. The meters were replaced, and the metering installations were recertified in all four cases. Details of the testing completed, and actions taken were recorded in the certification reports. The certification reports contain sufficient information to report to relevant parties and meet the requirements for a statement of situation.

Audit outcome

Compliant

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

Code related audit information

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

- the details and results of the tests carried out

- a conclusion, with reasons, as to whether or not the metering installation is faulty

- an assessment of the risk to the completeness and accuracy of the raw meter data

- the remedial action proposed or undertaken

- any correction factors to apply to raw meter data to ensure that the volume information is accurate

- the period over which the correction factor must be applied to the raw meter data.

Audit observation

I checked the results of the process followed for four examples of faulty metering installations.

Audit commentary

In all four cases, appropriate testing and reporting was conducted immediately. The meters were replaced, and the metering installations were recertified in all four cases. Details of the testing completed, and actions taken were recorded in the certification reports. The certification reports contain sufficient information to report to relevant parties and meet the requirements for a statement of situation.

Audit outcome

Compliant

7.4 Correction of Defects (Clause 10.47 of Part 10)

Code related audit information

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

Audit observation

I checked the results of the process followed for four examples of faulty metering installations.

Audit commentary

In all four cases, appropriate testing and reporting was conducted immediately. The meters were replaced, and the metering installations were recertified in all four cases. Details of the testing completed, and actions taken were recorded in the certification reports. The certification reports contain sufficient information to report to relevant parties and meet the requirements for a statement of situation.

Audit outcome

Compliant

8. Conclusions

The audit report records 16 non-compliances and makes nine recommendations for improvement.

Several of the non-compliances from the last audit have been resolved, mainly related to the accuracy of fields in certification reports, but there are still a number of non-compliant field processes, and the accuracy and readability of certification reports still requires attention.

The main issues are as follows:

1. 18 of 20 Category 2 certification reports had the selected component certification method recorded instead of the comparative method. Many of these had measuring transformers recorded as certified but calibration tests were not conducted.

2. The 18 installations above have CT certification stickers even though the CTs are not certified. These stickers will need to be removed.

3. It's likely a further 306 selected component certifications are actually comparative.

4. At least 68 category 2 installations certified with in-service burden lower than the burden range of the CTs.

5. Two ICPs have an error greater than the combined classes of the components, meaning at least one of the components is operating outside its class.

One of the main recommendations I have made is that validation is improved to ensure the issues raised in this report are identified and resolved as soon as possible. It also appears that improvements may be required in the training and competency area to minimise non-compliant field practices.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The Future Risk Rating table provides some guidance on this matter and recommends a next audit frequency of three months. I've balanced two issues with my recommendation for the next audit date, firstly the need to have the issues resolved and re-audited as soon as possible and the need to ensure there is sufficient time to make the improvements. I believe three months is insufficient time and I therefore recommend a next audit period of six months.

9. Wells Response

We acknowledge the issues raised, and have proposed remedial actions for them, and are planning steps to prevent recurrences. We are confident that we are now making sufficient improvements to our processes and training to address the issues which had evolved around CT certification and burdening requirements.