ELECTRICITY INDUSTRY PARTICIPATION CODE
METERING EQUIPMENT PROVIDER AUDIT REPORT

Provera

For

ADVANCED METERING ASSETS LIMITED
NZBN: 9429038499685

Prepared by: Brett Piskulic – Provera

Date audit commenced: 29 May 2023

Date audit report completed: 16 August 2023

Audit report due date: 26-Aug-23

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Advanced Metering Assets Limited (AMA) is a Metering Equipment Provider (MEP) and is required to undergo an audit by 26 August 2023, in accordance with clause 16A.17(a).

AMA has four MEP codes and two distinct operations. AMCI is the code for the Commercial and Industrial (C&I) operation and NGCM is the code for the mass market operation. The other two codes NGCS and STRM have no ICPs in the registry except 0000545280NRE79 which is an unmetered load ICP, therefore these codes are only mentioned in relevant sections.

This audit identified 21 areas of non-compliance and three recommendations are made. I have repeated a recommendation from the last audit regarding uncertainty calculations used by the Wells Approved Test House, and I recommend that AMA clarify the maximum interrogation cycles and services access interfaces for AMCI meters and ensure that this is recorded accurately in certification reports.

The number of errors found in certification reports from ATHs has decreased significantly since the last audit. AMA has regularly met with the ATHs to work on improving the quality of information recorded in certification reports.

The other main issues from this audit are as follows:

- certification is cancelled due to 383 NGCM and 142 AMCI inspections not being conducted,
- certification expired or cancelled for 25,654 NGCM metering installations,
- certification expired or cancelled for 435 AMCI metering installations,
- late updating of registry information,
- inaccurate registry information,
- some certification tests not completed by ATHs,
- notification of alternative certification not provided to the Authority within ten business days for two metering installations,
- 809 ICPs with time dependent meter registers that were not monitored every 12 months,
- meters not reinstated after bridging within five business days of bridging for five ICPs, and
- data not collected within the maximum interrogation cycle for seven AMCI ICPs.

On 15 June 2023 the Electricity Authority published a memo detailing changes to data collection responsibilities. This memo changes the arrangements originally established in 2013, which stated that all data collection, apart from AMI data collection, was the responsibility of the reconciliation participant. The 2023 memo changes the responsibility for some data collection from the reconciliation participant to the MEP, where the MEP has not provided the capability to collect data to the reconciliation participant. This means that where Advanced Metering Assets Limited (AMCI) is the MEP, data collection is being conducted as an MEP. Therefore, the MEP data collection responsibilities will be recorded in this audit report. This section of the audit was conducted by Steve Woods of Veritek as part of the AMA reconciliation agent audit that was already in-progress at the time the memo was issued. In future the AMCI data collection processes will be included in the MEP audit. The reconciliation participant agent report will include data collection for approximately 100 installations where AMCI is not the MEP and will cover the non-MEP functions such as application of compensation factors, validation, estimation and correction for all installations, including those where AMCI is the MEP. The table below shows the details of the recent memo.

Metering Type	Scenario	Responsibility	Comments
HHR	Where it is possible for other parties to interrogate the metering installation	Reconciliation Participant	Electronic interrogation.

HHR	Where the MEP **WILL NOT** provide the interrogation capability, password, or encryption details to the reconciliation participant.	~~Reconciliation Participant~~ Metering Equipment Provider	~~Although password means not possible for other parties to collect data, it is possible if MEP provides access. Electronic interrogation~~ If the MEP will not provide access, then the MEP must be responsible for interrogation.
HHR	Where the MEP **WILL** provide the interrogation capability, password, or encryption to the reconciliation participant.	Reconciliation Participant	Electronic interrogation.
AMI	Where the MEP **WILL NOT** provide the interrogation capability, password, or encryption details to the	Metering Equipment Provider	Note that where interrogation is via radio mesh or GPRS, the nature of communication and metering management systems means the MEP back-office systems are required to meet code obligations for interrogation.

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 provides some guidance on this matter and recommends an audit frequency of three months. After considering AMA's responses and the remedial actions proposed I recommend an audit frequency of 12 months to allow time for improvements to be made.

The matters raised are shown in the tables below.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
MEP responsibility for services access interface	2.1	10.9(2)	**NGCM** Services access interface incorrectly recorded in the certification records for two of 65 metering installations sampled.	Strong	Low	1	Identified
Provision of accurate information	2.5	11.2 and 10.6	**AMCI** and **NGCM** Some certification records not complete and accurate. Registry not always updated as soon as practicable.	Moderate	Low	2	Identified
Registry updates	3.2	2 of Schedule 11.4	**AMCI** and **NGCM** Some registry updates later than 15 business days.	Strong	Low	1	Identified
Changes to registry records	4.10	3 of Schedule 11.4	**NGCM** and **AMCI** Some records updated to the registry later than ten business days.	Moderate	Low	2	Identified
Accurate and Complete Records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	**NGCM** and **AMCI** Some inaccurate certification records.	Moderate	Low	2	Identified
Response to switch request	6.1	1(1) of Schedule 11.4	**NGCM** Seven late MN files. **AMCI** Ten late MN files.	Strong	Low	1	Identified
Provision of Registry Information	6.2	Clause 7 (1), (2) and (3) of	**NGCM** and **AMCI** Some registry records were incomplete or incorrect.	Moderate	Low	2	Identified

		Schedule 11.4					
Correction of Errors in Registry	6.3	Clause 6 of Schedule 11.4	**NGCM** and **AMCI** Discrepancies not resolved within five business days.	Moderate	Low	2	Identified
Cancellation of certification	6.4	6 of Schedule 11.4	Certification cancelled, and registry not updated within ten business days for: **NGCM** • three installations with low burden, • three bridged meters, and • 383 Category 2 installations with inspection not conducted. **AMCI** • 142 installations with inspection not conducted, • one installation with testing not conducted within 20 business days of sufficient load being identified, and • one faulty metering installation.	Moderate	Low	2	Identified
Certification of metering installations	7.1	10.38 (a), clause 1 & clause 15 of Schedule 10.7	**NGCM** Certification expired or cancelled for 25,654 NGCM metering installations. **AMCI** Certification expired for 435 AMCI metering installations.	Moderate	Medium	4	Identified
Certification Tests	7.2	10.38(b) and clause 9 of Schedule 10.6	**NGCM** Some certification tests were not conducted by ATHs.	Strong	Low	1	Identified

Insufficient load for Certification Tests	7.7	14(4) of Schedule 10.7)	**AMCI** One metering installation with testing not conducted within 20 business days of sufficient load being identified.	Strong	Low	1	Cleared
Alternative Certification Requirements	7.9	32(2), (3) and (4) of Schedule 10.7	**AMCI** Notification of alternative certification not provided to the Authority within ten business days for two metering installations.	Moderate	Low	2	Cleared
Timekeeping Requirements	7.10	23 of Schedule 10.7	**NGCM** 809 ICPs with time dependent meter registers that were not monitored every 12 months.	Moderate	Low	2	Identified
Interim certification	7.19	18 of Schedule 10.7	**NGCM** 17,737 ICPs with expired interim certification.	Moderate	Medium	4	Identified
Inspections	8.2	46(1) of Schedule 10.7	**NGCM** 383 metering installations with inspection not conducted. **AMCI** 142 metering installations with inspection not conducted. 20 NSP metering installations with inspections not conducted.	Moderate	Medium	4	Identified
Statement of Situation	9.3	46(2)	**AMCI** Statement of situation for faulty metering installation at NSP TGC0011TENCEN not provided to the Authority and affected participants within three business days.	Strong	Low	1	Cleared

Timeframe for correct defects and inaccuracies	9.4	10.46A	**NGCM** Remedial action not completed in required timeframe after notification of a faulty metering installation for nine ICPs.	Moderate	Low	2	Identified
Meter bridging	9.5	10.33C	**NGCM** Meters not reinstated after bridging within five business days of bridging for a sample of 15 of 26 bridged Category 1 meters.	Moderate	Low	2	Identified
Electronic Interrogation of Metering Installations	10.5	8(2), 8(3), 8(5) and 8(6) of Schedule 10.6	**AMCI** Data not collected within the maximum interrogation cycle for seven ICPs.	Strong	Low	1	Identified
Time errors	10.7	Clause 8(4) of Schedule 10.6	**NGCM** 2,116 examples of clock errors outside the allowable thresholds in the most recent reports. **AMCI** 44 clock errors outside the thresholds	Strong	Low	1	Identified
					Future Risk Rating	**40**	
					Indicative Audit Frequency	**3 months**	

Future risk rating	1-2	3-6	7-9	10-19	20-24	25+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Clause	Recommendation	Remedial Action
Services Access Interface	2.1	Regarding clause 10.9(2) and (3) and clause 10 of schedule 10.4	AMCI work with the ATHs ensure the processes to determine and record the services access interface are updated to meet the requirements of the Compliance Memo issued by the Electricity Authority on 15 June 2023 regarding the responsibility for data collection.	Identified
Metering Installation Design & Accuracy	4.3	4(1) of schedule 10.7	Monitor the potential remedial actions taken by the Wells ATH to ensure error and uncertainty calculations are accurate and include all sources of uncertainty.	Identified
Accurate and Complete Records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	Work with the ATHs to clarify the maximum interrogation cycles for AMCI meters and ensure that this is recorded accurately in certification reports.	Identified

ISSUES

Subject	Section	Recommendation	Description
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code (Section 11)

Code reference

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 Electricity Authority website and I confirm there is one exemption in place, exemption 296.

Audit commentary

Exemption 296 relates to clause 4(2)(a) of Schedule 10.7 of the Electricity Industry Participation Code 2010 ("Code") to not to use subtraction to determine submission information. This exemption applies only to ICP 0000840407WE388.

This exemption expires on the earlier of:

a. the close of 30 June 2025; and

b. the date when; Meridian Energy Limited is no longer in the registry as being the trader for ICP0000840407WE388; and

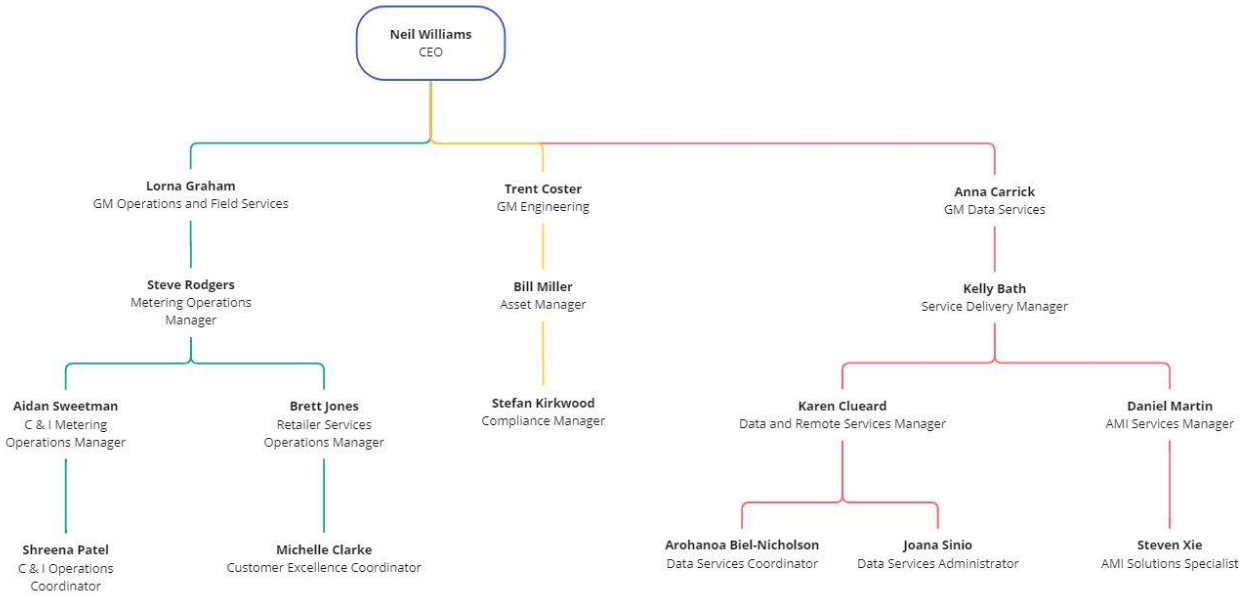
c. the date when Vector Metering is no longer recorded in the registry as being the Metering Equipment Provider for ICP 0000011015WEC04 or ICP 0000011055WEEA1; and

d. the date when Meridian Energy Limited no longer has an agreement with any retailer of ICP 0000015182WE1AD, ICP 0000025029WEF4E or ICP 0003146175WE243 to receive half hour metered data required in the subtraction calculation for ICP 0000840407WE388; and

e. the date on which the metering or distribution configuration is changed so that submission information no longer needs to be calculated by a subtractive process.

1.2. Structure of Organisation

AMA provided the organisation chart below.



1.3. Persons involved in this audit

Auditors:

Name	Company	Role
Brett Piskulic	Provera	Lead Auditor
Steve Woods	Veritek Limited	Supporting Auditor (AMCI Data Collection)

AMA personnel assisting in this audit were:

Name	Title
Stefan Kirkwood	Compliance Manager
Karen Clueard	Data and Remote Services Manager
Daniel Martin	AMI Services Manager
Arohanoa Biel-Nicholson	Data Services Coordinator
Steven Xie	AMI Solutions Specialist
Joana Sinio	Data Services Administrator
Michelle Clarke	Customer Excellence Coordinator
Aidan Sweetman	C & I Metering Operations Manager
Shreena Patel	C & I Operations Coordinator

1.4. Use of Agents (Clause 10.3)

Code reference

Clause 10.3

Code related audit information

A participant who uses a contractor

- *remains responsible for the contractor's fulfillment of the participants Code obligations*
- *cannot assert that it is not responsible or liable for the obligation due to the action of a contractor,*
- *must ensure that the contractor has at least the specified level of skill, expertise, experience, or qualification that the participant would be required to have if it were performing the obligation itself.*

Audit observation

NGCM

NGCM engages ATHs to conduct certification activities. These parties are not considered agents for certification activities, but they are considered agents for the storage of records in accordance with clauses 4(1)(v)&(viii) of schedule 10.6. I checked that records were available from the relevant ATHs.

The ATHs engaged are as follows:

- Accucal (ACCL),
- Wells (WELL),
- Delta (DELT), and
- AMS (VCOM).

AMCI

AMCI engages ATHs to conduct certification activities. These parties are not considered agents for this activity.

The ATHs engaged are as follows:

- Accucal (ACCL),
- Delta (DELT), and
- AMS (VCOM).

Audit commentary

NGCM

The agreements between NGCM and ATHs clearly specify that the ATHs are acting as an agent for these activities, and they are required to produce records within five business days. The provision and accuracy of records is discussed further in **section 5.1**.

AMCI

AMCI engages ATHs to conduct certification activities. These parties are not considered agents for this activity.

1.5. Hardware and Software

NGCM MEP data is held in JDE and Salesforce. AMCI data is held is ServiceMax. All systems are subject to backup arrangements in accordance with standard industry protocols.

1.6. Breaches or Breach Allegations

AMA confirmed there are no breach allegations related to the scope of this audit.

1.7. ICP Data

NGCM

Metering Category	Number of ICPs May 2023	Number of ICPs Jul 2022	Number of ICPs Sep 2021	Number of ICPs Feb 2021	Number of ICPs 2020	Number of ICPs 2019	Number of ICPs 2018	Number of ICPs 2017
1	**1,258,075**	1,215,413	1,173,177	1,142,301	1,108,598	1,119,048	1,102,244	1,019,761
2	**14,562**	14,232	13,863	13,502	12,950	12,578	11,868	10,145
3	**0**	0	0	0	0	0	0	0
4	**0**	0	0	0	0	0	0	0
5	**0**	0	0	0	0	0	0	0
9	**12**	18	21	10	18	22	8	5

AMCI

Metering Category	Number of ICPs May 2023	Number of ICPs Jul 2022	Number of ICPs Sep 2021	Number of ICPs Feb 2021	Number of ICPs 2020	Number of ICPs 2019	Number of ICPs 2018	Number of ICPs 2017
1	**992**	1,245	1,368	1,415	1,487	1,511	1,603	1,709
2	**5,762**	5,618	5,668	5,684	5,698	5,737	5,730	5,676
3	**3,888**	3,816	3,768	3,736	3,648	3,611	3,579	3,543
4	**1,733**	1,665	1,601	1,571	1,515	1,474	1,447	1,377
5	**197**	189	181	174	177	177	172	174
9	**25**	45	32	46	31	26	18	13

ICP 0000545280NRE79 is in the registry with STRM as the MEP, but it is a distributed unmetered load ICP and does not have metering installed.

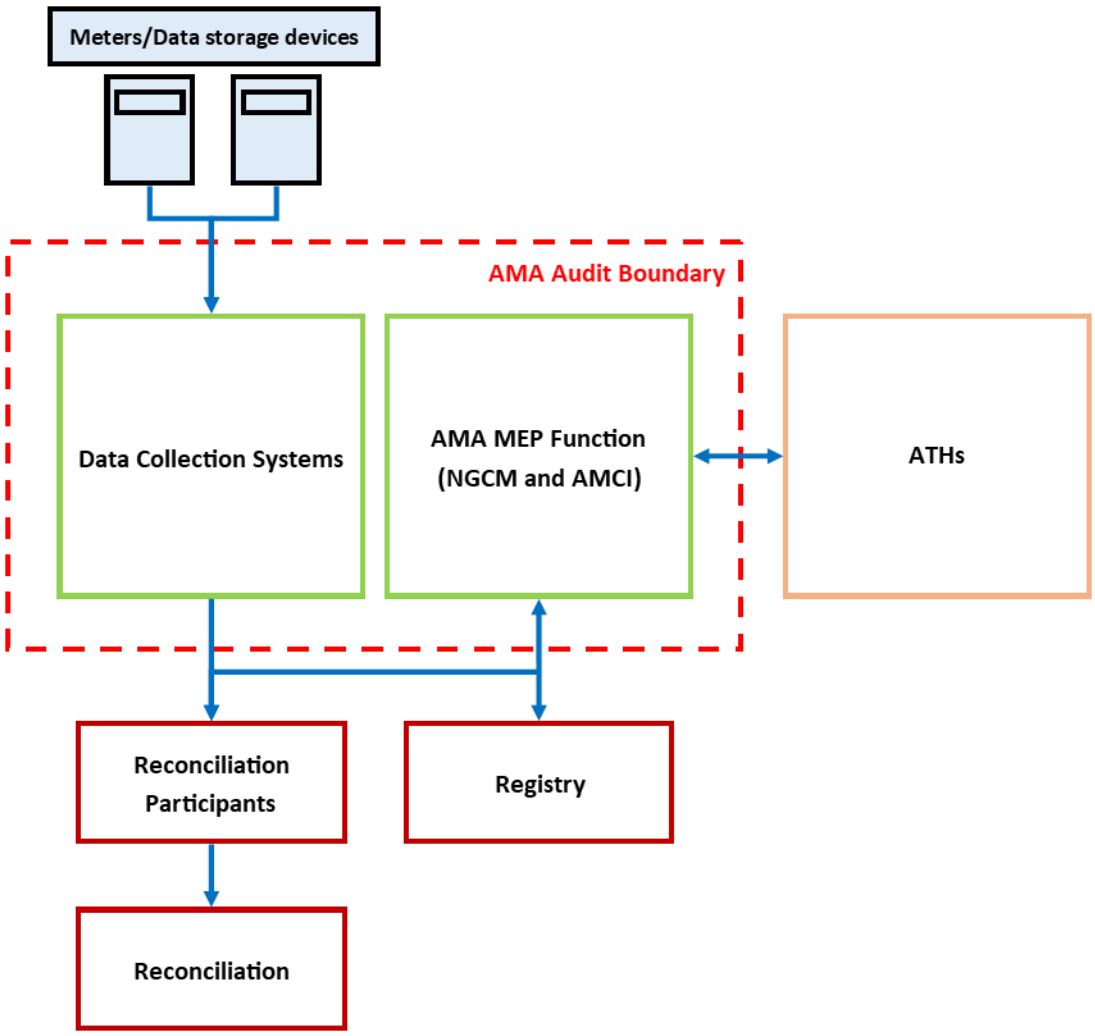
1.8. Authorisation Received

A letter of authorisation was not required or requested.

1.9. Scope of Audit

This audit was conducted in accordance with the Guideline for Metering Equipment Provider Audits V2.2, which was published by the Electricity Authority.

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



1.10. Summary of previous audit

The previous audit was conducted in October 2022 by Brett Piskulic of Veritek Limited. The table below shows the current status of the issues found.

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Status
MEP responsibility for services access interface	2.1	10.9(2)	**NGCM** Services access interface incorrectly recorded in the certification records for six of 70 metering installations sampled. **AMCI** Services access interface incorrectly recorded in the certification records for three metering installations and not recorded for one metering installation of 65 metering installations sampled.	Still existing for NGCM
Provision of accurate information	2.5	11.2 and 10.6	**NGCM** Some certification reports not complete and accurate. **AMCI** and **NGCM** Registry not always updated as soon as practicable.	Still existing
Registry updates	3.2	2 of Schedule 11.4	**AMCI** and **NGCM** Some registry updates later than 15 business days.	Still existing
Changes to registry records	4.10	3 of Schedule 11.4	**NGCM** and **AMCI** Some records updated to the registry later than ten business days.	Still existing
Accurate and Complete Records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	**NGCM** and **AMCI** Some inaccurate certification records.	Still existing
Response to switch request	6.1	1(1) of Schedule 11.4	**AMCI** 11 late MN files.	Still existing
Provision of Registry Information	6.2	Clause 7 (1), (2) and (3) of Schedule 11.4	**NGCM** and **AMCI** Some registry records incomplete or incorrect.	Still existing
Correction of Errors in Registry	6.3	Clause 6 of Schedule 11.4	**NGCM** and **AMCI** Discrepancies not resolved within five business days.	Still existing
Cancellation of certification	6.4	6 of Schedule 11.4	Certification cancelled, and registry not updated within ten business days for:	Still existing

			• NGCM – three installations with low burden, • NGCM – 534 Category 2 installations with inspection not conducted, • NGCM - three ICPs where sum-check failures were not resolved within three business days, • AMCI - one installation with low burden, • AMCI - 32 installations with inspection not conducted, and- • AMCI – one faulty metering installation.	
Certification of metering installations	7.1	10.38 (a), clause 1 & clause 15 of Schedule 10.7	**NGCM** Certification expired or cancelled for 32,914 NGCM metering installations. **AMCI** Certification expired for 359 AMCI metering installations.	Still existing
Certification Tests	7.2	10.38(b) and clause 9 of Schedule 10.6	**NGCM** Some certification tests not conducted by ATHs.	Still existing
Alternative Certification Requirements	7.9	32(2), (3) and (4) of Schedule 10.7	**AMCI** Notification of alternative certification not provided to the Authority within ten business days.	Still existing
Timekeeping Requirements	7.10	23 of Schedule 10.7	**NGCM** 257 ICPs with time dependent meter registers that were not monitored every 12 months.	Still existing
Interim certification	7.19	18 of Schedule 10.7	**NGCM** 20,909 ICPs with expired interim certification.	Still existing
Category 1 Inspections	8.1	45 of Schedule 10.7	**NGCM** and **AMCI** Incorrect date used to determine sample size for Category 1 sample inspections.	Cleared
Inspections	8.2	46(1) of Schedule 10.7	**NGCM** 539 metering installations with inspection not conducted. **AMCI** 32 Metering installations with inspection not conducted.	Still existing
Timeframe for correct defects and inaccuracies	9.4	10.46A	**NGCM** Remedial action not completed in required timeframe after notification of a faulty metering installation for nine ICPs.	Still existing
Meter bridging	9.5	10.33C	**NGCM**	Still existing

			Meters not reinstated after bridging within five business days of bridging for 22 Category 1 ICPs.	
Time errors	10.7	Clause 8(4) of Schedule 10.6	**NGCM** 1,164 examples of clock errors outside the allowable thresholds in the most recent reports.	Still existing

RECOMMENDATIONS

Subject	Section	Clause	Recommendation	Status
Metering Installation Design & Accuracy	4.3	4(1) of schedule 10.7	Monitor the potential remedial actions taken by the Wells ATH to ensure error and uncertainty calculations are accurate and include all sources of uncertainty.	Still existing
Accurate and Complete Records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	Work with the ATHs to clarify the maximum interrogation cycles for AMCI meters and ensure that this is recorded accurately in certification reports.	Still existing
Timekeeping Requirements	7.10	23 of Schedule 10.7	Develop a process to identify meters which become subject to the timekeeping Requirements of Clause 23 of Schedule 10.7 and ensure the time is monitored and corrected as required.	Cleared

2. OPERATIONAL INFRASTRUCTURE

2.1. MEP responsibility for services access interface (Clause 10.9(2))

Code reference

Clause 10.9(2)

Code related audit information

The MEP is responsible for providing and maintaining the services access interface.

Audit observation

NGCM

The Code places responsibility for maintaining the services access interface on the MEP and places responsibility for determining and recording it with ATHs. I checked the certification records for 65 metering installations.

AMCI

The Code places responsibility for maintaining the services access interface on the MEP and places responsibility for determining and recording it with ATHs. I checked the certification records for 66 metering installations.

Since 1 February 2021 the Code requires that all possible services access interfaces be recorded. This is discussed further in **section 5.1**.

Audit commentary

NGCM

I checked 65 certification records and found that in two cases the ATHs had not recorded all possible services access interfaces.

For AMI metering installations the services access interface will normally be "remote". It is also possible that the services access interface may be local for these metering installations if there are problems communicating with the meters. The AMA, Delta and Wells ATHs have improved their processes to record each services access interface and all options were correctly recorded by these ATHs. There were two metering installations certified by the Accucal ATH during the audit period, I checked the records for both of these certifications and found that each available services access interface option was not recorded in both cases.

AMCI

On 15 June 2023 the Electricity Authority issued a Compliance Memo regarding the responsibility for data collection. The memo advised that the Authority's 2013 interpretation of clause 8(7) of Schedule 10.6 is no longer fit for purpose. The new interpretation now places responsibility for data collection of HHR metering with the MEP not the reconciliation participant as was the case with the previous interpretation. This also means the location of the services access interface is shifted from the meter to the output of the MEP's back office.

As all of the 66 certification reports checked were for certifications which took place before the memo was issued. I have checked that the services access interface has been recorded as local in accordance with the previous interpretation.

I recommend that AMCI works with the ATHs to ensure the processes to determine and record the services access interface are updated to meet the requirements of the new interpretation.

Recommendation	Description	Audited party comment	Remedial action
Regarding clause 10.9(2) and (3) and clause 10 of schedule 10.4	AMCI work with the ATHs ensure the processes to determine and record the services access interface are updated to meet the requirements of the Compliance Memo issued by the Electricity Authority on 15 June 2023 regarding the responsibility for data collection.	Vector Metering agrees with this recommendation and will action it.	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 10.9(2) From: 01-Nov-22 To: 29-May-23	**NGCM** Services access interface incorrectly recorded in the certification records for two of 65 metering installations sampled. Potential impact: Low Actual impact: None 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 the services access interface is still maintained in a compliant manner despite the incorrect recording in certification reports. There is no impact because the MEP normally determines the location of the services access interface; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Vector metering will request that the non-compliant certification reports are corrected by the ATH.	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to work with ATHs to ensure they are aware that all possible SAI must be stated in the certification record.	31/10/2023	

2.2. Dispute Resolution (Clause 10.50(1) to (3))

Code reference

Clause 10.50(1) to (3)

Code related audit information

Participants must in good faith use its 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

NGCM

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

AMCI

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

Audit commentary

NGCM

NGCM has not been required to resolve any disputes in accordance with this clause.

AMCI

AMCI has not been required to resolve any disputes in accordance with this clause.

Audit outcome

Compliant

2.3. MEP Identifier (Clause 7(1) of Schedule 10.6)

Code reference

Clause 7(1) of Schedule 10.6

Code related audit information

The MEP must ensure it has a unique participant identifier and must use this participant identifier (if required) to correctly identify its information.

Audit observation

NGCM

I checked the registry data to ensure the correct MEP identifier was used.

AMCI

I checked the registry data to ensure the correct MEP identifier was used.

Audit commentary

NGCM

NGCM uses the NGCM identifiers for all MEP functions.

AMCI

AMCI uses the AMCI code for all MEP functions.

Audit outcome

Compliant

2.4. Communication Equipment Compatibility (Clause 40 Schedule 10.7)

Code reference

Clause 40 Schedule 10.7

Code related audit information

The MEP must ensure that the use of its communication equipment complies with the compatibility and connection requirements of any communication network operator the MEP has equipment connected to.

Audit observation

NGCM

Relevant documentation was checked to ensure the compatibility of communication equipment.

AMCI

Relevant documentation was checked to ensure the compatibility of communication equipment.

Audit commentary

NGCM

NGCM ensures all communication equipment is appropriately certified with the relevant telecommunications standards. This is recorded in type test certificates and other approval documents. Testing is also conducted by their telecommunications provider, Vodafone to ensure compliance.

AMCI

AMCI ensures all communication equipment is appropriately certified with the relevant telecommunications standards. This is recorded in type test certificates and other approval documents. Testing is also conducted by Vodafone to ensure compliance.

Audit outcome

Compliant

2.5. Participants to Provide Accurate Information (Clause 11.2 and Clause 10.6)

Code reference

Clause 11.2 and Clause 10.6

Code related audit information

The MEP must take all practicable steps to ensure that information that the MEP is required to provide to any person under Parts 10 and 11 is complete and accurate, not misleading or deceptive and not likely to mislead or deceive.

If the MEP becomes aware that in providing information under Parts 10 and 11, the MEP has not complied with that obligation, the MEP must, as soon as practicable, provide such further information as is necessary to ensure that the MEP does comply.

Audit observation

NGCM

The content of this audit report was reviewed to determine whether all practicable steps had been taken to provide accurate information.

AMCI

The content of this audit report was reviewed to determine whether all practicable steps had been taken to provide accurate information.

Audit commentary

NGCM

As mentioned in **sections 5** and **6** there are some registry and certification records which are not complete and accurate. NGCM is attempting to correct information as soon as practicable. There are some metering installations with cancelled certification and the registry has not been updated as soon as practicable.

AMCI

As mentioned in **sections 5** and **6** there are some registry and certification records which are not complete and accurate. AMCI is attempting to correct information as soon as practicable. There are some metering installations with cancelled certification and the registry has not been updated as soon as practicable.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11.2 and Clause 10.6 From: 01-Nov-22 To: 29-May-23	**AMCI** and **NGCM** Some certification records not complete and accurate. Registry not always updated as soon as practicable. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are recorded as moderate because there is room to improve processes. The impact on other participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Vector Metering is in the process of correcting all identified inaccuracies.	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will look at its process and training to identify any opportunities to improve its performance and strengthen its controls.	31/12/2023	

3. PROCESS FOR A CHANGE OF MEP

3.1. Change of metering equipment provider (Clause 10.22)

Code reference

Clause 10.22

Code related audit information

The MEP for a metering installation may change only if the responsible participant enters into an arrangement with another person to become the MEP for the metering installation, and if certain requirements are met in relation to updating the registry and advising the reconciliation manager.

The losing MEP must notify the gaining MEP of the proportion of the costs within 40 business days of the gaining MEP assuming responsibility. The gaining MEP must pay the losing MEP within 20 business days of receiving notification from the losing MEP.

The costs are those directly and solely attributable to the certification and calibration tests of the metering installation or its components from the date of switch until the end of the current certification period.

The gaining MEP is not required to pay costs if:

- *the losing MEP has agreed in writing that the gaining MEP is not required to pay costs, or the losing MEP has failed to provide notice within 40 business days.*
- *within three business days, the gaining MEP replaces, removes or recertifies the metering component or metering installation,*
- *the losing MEP has failed to provide notice of the costs to the gaining MEP within 40 business days.*

Audit observation

NGCM

I checked if NGCM had received any claims for costs.

AMCI

I checked if AMCI had received any claims for costs.

Audit commentary

NGCM

NGCM has not sent or received any invoices. The table below shows that there is only one scenario where costs will be payable, and this is unlikely to occur.

Scenario	Likelihood of occurring	Costs payable
Gaining MEP replaces losing MEPs component	High	No
Gaining MEP removes losing MEPs component	High	No
Gaining MEP recertifies losing MEPs component	High	No
Gaining MEP replaces losing MEPs installation	High	No
Gaining MEP removes losing MEPs installation	High	No

Gaining MEP recertifies losing MEPs installation	High	No
Gaining MEP retains losing MEPs components and metering installation	Zero	Yes

AMCI

AMCI have not sent or received any invoices in relation to this clause.

Audit outcome

Compliant

3.2. Registry Notification of Metering Records (Clause 2 of Schedule 11.4)

Code reference

Clause 2 of Schedule 11.4

Code related audit information

The gaining MEP must advise the registry of the registry metering records for the metering installation within 15 days of becoming the MEP for the metering installation.

Audit observation

NGCM

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 for all records where NGCM became the MEP to evaluate the timeliness of updates.

AMCI

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 for all records where AMCI became the MEP to evaluate the timeliness of updates.

Audit commentary

NGCM

I examined the audit compliance report for 22,140 switches in relation to this clause and the findings are shown in the table below. 2,351 of the late updates were due to the trader's nomination being later than five business days. I checked a sample of 20 updates for events which occurred during the audit period in detail and found the following:

- corrections of incorrect details from original update for one example,
- automated registry update failures due to missing or incorrect information received from the ATH for six examples,
- a previous MEP event for removed metering blocking the loading of new metering in the registry for nine examples, and
- late receipt of certification details from the ATH for four examples.

Year	ICPs Switched	Notified to registry within 15 days	Percentage compliant	Average days
Feb 2017	3,307	3,155	95%	9.7
Oct 2017	1,285	1,078	84%	8.6
Oct 2018	1,241	1,044	84%	17
Jul 2019	5,260	4,820	92%	9
Jan 2020	16,205	10,133	63%	Not calculated

Jan 2021	13,613	11,944	88%	Not calculated
Sep 2021	17,409	15,642	89.85%	Not calculated
Jul 2022	26,367	24,168	91.66%	Not calculated
May 2023	**22,140**	**19,616**	**88.6%**	Not calculated

AMCI

I examined the audit compliance report for 110 switches in relation to this clause and the findings are shown in the table below. 43 late updates were identified by the audit compliance report. Analysis of the late updates found that six were due to late nomination by the trader, 35 were due to corrections of historical registry information and two were due to a subsequent event by the loosing MEP preventing AMCI from updating the registry until the event was reversed.

Year	ICPs	Notified to registry within 15 days	Percentage compliance	Average days
Feb 2017	71	49	69%	
Oct 2017	41	26	63%	
Oct 2018	39	31	80%	26.6
Jul 2019	48	22	46%	18
Jan 2020	176	46	26%	Not calculated
Jan 2021	148	42	28%	Not calculated
Sep 2021	68	17	25%	Not calculated
Jul 2022	105	51	48%	Not calculated
May 2023	**110**	**67**	**60.91%**	**Not calculated**

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 2 of Schedule 11.4 From: 01-Nov-22 To: 29-May-23	**AMCI** and **NGCM** Some registry updates later than 15 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are in place to ensure the timeliness of updates, but AMA is often prevented from updating the registry due to late field notification. The impact on other participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Timeliness issues that have already occurred are unable to be resolved	NA	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will review its processes to determine what improvements can be made and communicate with other participants to remind them of their responsibilities.	Ongoing	

3.3. Provision of Metering Records to Gaining MEP (Clause 5 of Schedule 10.6)

Code reference

Clause 5 of Schedule 10.6

Code related audit information

During an MEP switch, a gaining MEP may request access to the losing MEP's metering records.

On receipt of a request from the gaining MEP, the losing MEP has ten business days to provide the gaining MEP with the metering records or the facilities to enable the gaining MEP to access the metering records.

The losing MEP must ensure that the metering records are only received by the gaining MEP or its contractor, the security of the metering records is maintained, and only the specific metering records required for the purposes of the gaining MEP exercising its rights and performing its obligations are provided.

Audit observation

NGCM

I checked with NGCM to confirm whether there had been any requests from other MEPs.

AMCI

I checked with AMCI to confirm whether there had been any requests from other MEPs.

Audit commentary

NGCM

This has not occurred, and no examples are available to examine.

AMCI

This has not occurred, and no examples are available to examine.

Audit outcome

Compliant

3.4. Termination of MEP Responsibility (Clause 10.23)

Code reference

Clause 10.23

Code related audit information

Even if the MEP ceases to be responsible for an installation, the MEP must either comply with its continuing obligations; or before its continuing obligations terminate, enter into an arrangement with a participant to assume those obligations.

The MEP is responsible if it:

- *is identified in the registry as the primary metering contact or*
- *is the participant who owns the meter for the POC or to the grid or*
- *has accepted responsibility under clause 1(1)(a)(ii) of schedule 11.4 or*
- *has contracted with a participant responsible for providing the metering installation.*

MEPs obligations come into effect on the date recorded in the registry as being the date on which the metering installation equipment is installed or, for an NSP the effective date set out in the NSP table on the Authority's website.

An MEPs obligations terminate only when:

- *the ICP changes under clause 10.22(1)(a),*
- *the NSP changes under clause 10.22(1)(b), in which case the MEPs obligations terminate from the date on which the gaining MEP assumes responsibility,*
- *the metering installation is no longer required for the purposes of Part 15, or*
- *the load associated with an ICP is converted to be used solely for unmetered load.*

Audit observation

NGCM

I confirmed that NGCM has ceased to be responsible for some metering installations by checking the event detail report.

AMCI

I confirmed that AMCI has ceased to be responsible for some metering installations by checking the event detail report.

Audit commentary

NGCM

NGCM has ceased to be responsible for some metering installations and they continue with their responsibilities, mainly in relation to the storage of records, which are kept indefinitely. As mentioned in **section 1.4**, some of these responsibilities will be met by ATHs on behalf of NGCM.

AMCI

AMCI has ceased to be responsible for some metering installations and they continue with their responsibilities, mainly in relation to the storage of records, which are kept indefinitely.

Audit outcome

Compliant

4. INSTALLATION AND MODIFICATION OF METERING INSTALLATIONS

4.1. Design Reports for Metering Installations (Clause 2 of Schedule 10.7)

Code reference

Clause 2 of Schedule 10.7

Code related audit information

The MEP must obtain a design report for each proposed new metering installation or a modification to an existing metering installation, before it installs the new metering installation or before the modification commences.

Clause 2(2) and (3)—The design report must be prepared by a person with the appropriate level of skills, expertise, experience and qualifications and must include a schematic drawing, details of the configuration scheme that programmable metering components are to include, confirmation that the configuration scheme has been approved by an approved test laboratory, maximum interrogation cycle for each services access interface, any compensation factor arrangements, method of certification required, and name and signature of the person who prepared the report and the date it was signed.

Clause 2(4)—The MEP must provide the design report to the certifying ATH before the ATH installs or modifies the metering installation (or a metering component in the metering installation).

Audit observation

NGCM

NGCM has engaged the Accucal, AMS, Delta, and Wells ATHs for certification activities. The ATHs have provided design reports for this work, which I have checked. I checked that ATHs were correctly recording the design report in the certification records.

ACMI

AMCI has engaged the AMS, Delta and Accucal, ATHs for certification activities. The ATHs have provided design reports for this work which I have checked.

Audit commentary

NGCM

The design reports used by the ATHs include all the relevant details. The ATHs had correctly recorded the design for all 65 metering installation certification reports checked.

ACMI

AMCI has a generic design report. This design report contains most of the information above but does not include the configuration scheme. It is considered that the certification records become part of the design report once the certification is complete. The certification records include the configuration information.

Audit outcome

Compliant

4.2. Contracting with ATH (Clause 9 of Schedule 10.6)

Code reference

Clause 9 of Schedule 10.6

Code related audit information

The MEP must, when contracting with an ATH in relation to the certification of a metering installation, ensure that the ATH has the appropriate scope of approval for the required certification activities.

Audit observation

NGCM

I confirmed that NGCM has used the Accucal, AMS, Delta, and Wells ATHs and checked the scope of approval for each.

ACMI

I confirmed that AMCI has used AMS, Delta, and Accucal ATHs and checked the scope of approval for each.

Audit commentary

NGCM

The Accucal, AMS, Delta, and Wells ATHs have appropriate scope of approval for the activities undertaken for NGCM.

ACMI

The AMS, Delta, and Accucal ATHs have appropriate scope of approval for the activities undertaken for AMCI.

Audit outcome

Compliant

4.3. Metering Installation Design & Accuracy (Clause 4(1) of Schedule 10.7)

Code reference

Clause 4(1) of Schedule 10.7

Code related audit information

The MEP must ensure:

- *that the sum of the measured error and uncertainty does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of the metering installation*
- *the design of the metering installation (including data storage device and interrogation system) will ensure the sum of the measured error and the smallest possible increment of the energy value of the raw meter data does not exceed the maximum permitted error set out in Table 1 of Schedule 10.1 for the category of installation.*
- *the metering installation complies with the design report and the requirements of Part 10.*

Audit observation

NGCM

I checked the processes used by NGCM to ensure compliance with the design and with the error thresholds stipulated in Table 1. I also checked the certification records for 65 metering installations.

AMCI

I checked the processes used by AMCI to ensure compliance with the design and with the error thresholds stipulated in Table 1. I also checked the certification records for 66 metering installations.

Audit commentary

NGCM

The ATHs have compliant practices and are calculating uncertainty for metering installations certified using the comparative recertification method. My checks of 23 Category 2 metering installation certification reports using the comparative recertification method confirmed that error and uncertainty were both recorded. The last four Wells ATH reports contained two recommendations regarding error and uncertainty calculations which are relevant to NGCM. The Wells process is that the technician starts and stops the working standard by pushing a button when the least significant digit on the meter registers advances. The uncertainty calculation does not include any potential error introduced by the reaction time of the technician when pushing the button. It was recommended 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. The second point relates to temperature. 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. It was recommended that Wells review the application of the ambient temperature influence to determine if the adjustment of the overall error figure is necessary. I repeat the recommendation from the last audit that NGCM monitor the actions taken by the Wells ATH to ensure error and uncertainty calculations are accurate and include all sources of uncertainty.

Recommendation	Description	Audited party comment	Remedial action
4(1) of schedule 10.7	Monitor the potential remedial actions taken by the Wells ATH to ensure error and uncertainty calculations are accurate and include all sources of uncertainty.	Vector Metering agrees with this recommendation and will action it.	Identified

The design report was recorded for all 65 installations checked.

AMCI

The ATHs have compliant practices and uncertainty for metering installations certified using the comparative and fully calibrated methods is correctly calculated and recorded in the certification recorded. My checks of the metering installation certification reports for seven Category 2 installations certified using the comparative recertification method and 25 Category 3 to 5 installations certified using the fully calibrated method confirmed that error and uncertainty were correctly calculated and recorded.

A design report reference was recorded for all 66 installations checked.

Audit outcome

Compliant

4.4. Net metering and Subtractive Metering (Clause 10.13A and 4(2)(a) of Schedule 10.7)

Code reference

Clause 10.13A and Clause 4(2)(a) of Schedule 10.7

Code related audit information

MEPs must ensure that the metering installation records imported electricity separately from exported electricity. For category 1 and 2 installations the MEP must ensure the metering installation records imported and exported electricity separately for each phase. For category 3 or higher installations, the MEP does not need to ensure that imported and exported electricity is recorded separately for each phase.

If the metering installation contains multiple phases, the MEP may aggregate together the amounts of imported electricity recorded on different phases, or the amounts of exported electricity recorded on different phases. However, the MEP must not aggregate imported and exported electricity together. For metering installations for ICPs that are not also NSPs, the MEP must ensure that the metering installation does not use subtraction to determine submission information used for the purposes of Part 15.

Audit observation

NGCM

I asked NGCM to confirm whether subtraction was used and whether imported and exported electricity is recorded separately for each phase for any metering installations where they were the MEP.

AMCI

I asked AMCI to confirm whether subtraction was used and whether imported and exported electricity is recorded separately for each phase for any metering installations where they were the MEP.

Audit commentary

NGCM

NGCM does not have any metering installations where subtractive metering is used. All current metering installations record import and export separately for each phase.

AMCI

There is one case where subtraction is used in a metering installation, this is conducted under exemption 296 at ICP 0000840407WE388 as detailed in **section 1.1**.

AMCI confirmed that there are no other metering installations where subtractive metering is used. All current metering installations record import and export separately for each phase.

Audit outcome

Compliant

4.5. HHR Metering (Clause 4(2)(b) of Schedule 10.7)

Code reference

Clause 4(2)(b) of Schedule 10.7

Code related audit information

For metering installations for ICPs that are not also NSPs, the MEP must ensure that all category 3 or higher metering installations must be half-hour metering installations.

Audit observation

NGCM

NGCM is not responsible for any metering installations at Category 3 and above.

AMCI

I checked the audit compliance report to confirm compliance with this requirement.

Audit commentary

NGCM

NGCM is not responsible for any metering installations at Category 3 and above.

AMCI

I checked the audit compliance report which confirmed that all metering installations at or above Category 3 are HHR.

Audit outcome

Compliant

4.6. NSP Metering (Clause 4(3) of Schedule 10.7)

Code reference

Clause 4(3) of Schedule 10.7

Code related audit information

The MEP must ensure that the metering installation for each NSP that is not connected to the grid does not use subtraction to determine submission information used for the purposes of Part 15 and is a half-hour metering installation.

Audit observation

NGCM

I checked if NGCM is responsible for any NSP metering.

AMCI

I checked if AMCI is responsible for any NSP metering.

Audit commentary

NGCM

NGCM is the MEP for two embedded networks with NSP metering. I checked and confirmed that subtraction is not used to determine submission information.

AMCI

AMCI is the MEP for 300 embedded networks with NSP Metering. I checked and confirmed that subtraction is not used to determine submission information.

Audit outcome

Compliant

4.7. Responsibility for Metering Installations (Clause 10.26(10))

Code reference

Clause 10.26(10)

Code related audit information

The MEP must ensure that each point of connection to the grid for which there is a metering installation that it is responsible for has a half hour metering installation.

Audit observation

NGCM

NGCM is not responsible for any grid metering.

AMCI

AMCI is not the MEP for any grid metering.

Audit commentary

NGCM

NGCM is not responsible for any grid metering.

AMCI

AMCI is not the MEP for any grid metering.

Audit outcome

Compliant

4.8. Suitability of Metering Installations (Clause 4(4) of Schedule 10.7)

Code reference

Clause 4(4) of Schedule 10.7

Code related audit information

The MEP must, for each metering installation for which it is responsible, ensure that it is appropriate having regard to the physical and electrical characteristics of the POC.

Audit observation

NGCM

NGCM's instructions to ATH's include several clauses in relation to physical and electrical characteristics.

AMCI

AMCI's instructions to ATH's include several clauses in relation to physical and electrical characteristics.

Audit commentary

NGCM

NGCM's instructions to ATH's include several clauses in relation to physical and electrical characteristics.

AMCI

AMCI's instructions to ATH's include several clauses in relation to physical and electrical characteristics.

Audit outcome

Compliant

4.9. Installation & Modification of Metering Installations (Clauses 10.34(2), (2A), (2D) and (3))

Code reference

Clauses 10.34(2), (2A) and (3)

Code related audit information

If a metering installation is proposed to be installed or modified at a POC, other than a POC to the grid, the MEP must consult with and use its best endeavours, to agree with the distributor and the trader for that POC, before the design is finalised, on the metering installations:

- *required functionality,*
- *terms of use,*
- *required interface format,*
- *integration of the ripple receiver and the meter,*
- *functionality for controllable load.*

This includes where the MEP is proposing to replace a metering component or metering installations with the same or similar design and functionality but excludes where the MEP has already consulted on the design with the distributor and trader.

Each participant involved in the consultations must use its best endeavours to reach agreement and act reasonably and in good faith.

Audit observation

NGCM

NGCM has provided copies of the design reports to all distributors and traders in order to achieve compliance with this requirement.

AMCI

AMCI has provided copies of the design reports to all distributors and traders in order to achieve compliance with this requirement.

Audit commentary

NGCM

NGCM has provided copies of the design reports to all distributors and traders in order to achieve compliance with this requirement.

AMCI

AMCI has provided copies of the design reports to all distributors and traders in order to achieve compliance with this requirement.

Audit outcome

Compliant

4.10. Changes to Registry Records (Clause 3 of Schedule 11.4)

Code reference

Clause 3 of Schedule 11.4

Code related audit information

If the MEP has an arrangement with the trader the MEP must advise the registry manager of the registry metering records, or any change to the registry metering records, for each metering installation for which it is responsible at the ICP, no later than ten business days following:

a) the electrical connection of the metering installation at the ICP
b) any subsequent change to the metering installation's metering records

If the MEP is updating the registry in accordance with 8(11)(b) of Schedule 10.6, it must do so within ten business days after the most recent unsuccessful interrogation.

If the MEP is updating the registry in accordance with clause 8(13) of Schedule 10.6, it must do so within 3 business days following the expiry of the time period or date from which the MEP determines it cannot restore communications.

Audit observation

NGCM

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 to evaluate the timeliness of registry updates.

AMCI

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 to evaluate the timeliness of registry updates.

Audit commentary

NGCM

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 and the table below shows the results.

Event type	Year	Total	Total within ten days	% Compliant	Average days
Recertification	Feb 2017	79,049	70,634	89%	27.7
	Oct 2017	59,360	52,948	89%	39
	Oct 2018	73,361	69,249	94%	17.7
	Jul 2019	48,679	36,836	76%	106
	Jan 2020	131,096	57,512	44%	91
	Jan 2021	417,406	381,958	92%	36
	Sept 2021	28,812	25,998	90.23%	14.77
	Jul 2022	39,979	36,133	90.38%	5.71
	May 2023	**40,439**	**31,878**	**78.83%**	**8.57**
New connection	Feb 2017	1,581	1,471	93%	5.4
	Oct 2017	2,415	1,955	81%	8.6
	Oct 2018	2,348	2,143	91%	6.0
	Jul 2019	6,505	6,151	95%	3
	Jan 2020	14,329	12,598	88%	Not calculated
	Jan 2021	20,519	19,964	97%	Not calculated
	Sept 2021	13,655	13,259	97.1%	Not calculated
	Jul 2022	15,767	15,469	98.11%	Not calculated
	May 2023	**15,704**	**15,247**	**97.09%**	Not calculated

I was unable to accurately determine the total number of updates after recertification due to a high number of duplicates in the audit compliance report AC020MEP04 (Metering update after recertification). None of the reports account for reversed and replaced events, which leads to inaccurate reporting. I checked a sample of 20 updates for recertification events which occurred during the audit period in detail and found the following:

- corrections of incorrect details from original update for seven examples,

- automated registry update failures due to missing or incorrect information received from the ATH for five examples,
- late receipt of certification details from the ATH for four examples, and
- delay processing bulk registry update of statistical recertification for four examples.

279 of 457 late updates for new connections were due to late nomination by the trader. I checked a sample of 20 late updates for new connections which occurred during the audit period in detail and found the following:

- corrections of incorrect details from original update for five examples,
- automated registry update failures due to missing or incorrect information received from the ATH for seven examples, and
- late receipt of certification details from the ATH for eight examples.

AMCI

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 and the table below shows the results.

Event type	Year	Total	Within ten days	% Compliance	Average days
Recertification	2015	1,373	309	23%	
	2016	2,040	908	45%	
	Feb 2017	3,828	868	23%	
	Oct 2017	6,403	3,616	56%	
	Oct 2018	1,470	638	43%	327
	Jul 2019	23,679	18,673	79%	171
	Jan 2020	2,633	679	26%	296
	Jan 2021	3,498	1,074	30.7%	360
	Sep 2021	1,528	934	38.87%	326
	Jul 2022	1,763	904	51.28%	258
	May 2023	**1,219**	**729**	**59.8%**	**231**
New Connection	2015	118	26	22%	
	2016	82	28	34%	
	Feb 2017	64	38	59%	
	Oct 2017	53	14	26%	
	Oct 2018	41	14	34%	19
	Jul 2019	112	71	37%	20
	Jan 2020	205	33	16%	Not calculated
	Jan 2021	270	83	30.74%	Not calculated
	Sep 2021	153	35	22.88%	Not calculated
	Jul 2022	228	66	28.95%	Not calculated
	May 2023	**247**	**135**	**54.66%**	**Not calculated**

The audit compliance report identified 490 late updates after recertification. There were 32 updates incorrectly included due to duplicates in the audit compliance report AC020MEP04 (Metering update after recertification), the 32 were also identified in AC020MEP01 (New MEP not a new connection). There were 241 late updates after recertification with certification dates prior to 2022, I have assumed that these are all corrections. I checked a sample of 20 of the remaining late updates for recertification events which occurred during the audit period in detail and found:

- 13 were due to corrections of incorrect details from the original update,
- five were due to late updates by AMCI due to processing delays, and
- late receipt of certification details from ATH for two examples.

17 of 112 late updates for new connections were due to late nomination by the trader. 51 were corrections of incorrect details from the original update. I checked a sample of five of the remaining late updates in detail and found:

- late receipt of certification details from the ATH for one example, and
- four were due to late updates by AMCI due to processing delays.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.10 With: Clause 3 of Schedule 11.4 From: 01-Nov-22 To: 29-May-23	**NGCM** and **AMCI** Some records updated to the registry later than ten business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate in this area because there is room for improvement. Late updates for new connections can have a minor impact on participants and settlement, therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Timeliness issues that have already occurred are unable to be resolved	NA	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to review processes to ensure data is complete and accurate and implement a process to monitor and resolve issues are identified and amended in a timely fashion, and strengthen its controls.	Ongoing	

4.11. Metering Infrastructure (Clause 10.39(1))

Code reference

Clause 10.39(1)

Code related audit information

The MEP must ensure that for each metering installation:

- *an appropriately designed metering infrastructure is in place,*
- *each metering component is compatible with, and will not interfere with any other component in the installation,*
- *collectively, all metering components integrate to provide a functioning system,*
- *each metering installation is correctly and accurately integrated within the associated metering infrastructure.*

Audit observation

NGCM

The AMI metering and data collection system is considered "metering infrastructure". The design report and type test report were checked to confirm compliance.

AMCI

The data collection system is considered "metering infrastructure". The design report and type test report were checked to confirm compliance.

Audit commentary

NGCM

The type test report, design report and this audit report confirm that the system will operate in a compliant manner.

AMCI

The type test report, design report and this audit report confirm that the system will operate in a compliant manner. Output to host checks confirm the system operates as intended before certification is applied.

Audit outcome

Compliant

4.12. Decommissioning of an ICP (Clause 10.23A)

Code reference

Clause 10.23A

Code related audit information

If a metering installation at an ICP is to be decommissioned, but the ICP is not being decommissioned, the MEP that is responsible for decommissioning the metering installation must:

- *if the MEP is responsible for interrogating the metering installation, arrange for a final interrogation to take place before the metering installation is decommissioned, and provide the raw meter data from the interrogation to the responsible trader,*
- *if another participant is responsible for interrogating the metering installation, advise the other participant not less than 3 business days before the decommissioning of the time and date of the decommissioning, and that the participant must carry out a final interrogation.*

To avoid doubt, if a metering installation at an ICP is to be decommissioned because the ICP is being decommissioned:

- *the trader, not the MEP, is responsible for arranging a final interrogation of the metering installation,*
- *the responsible trader must arrange for a final interrogation of the metering installation.*

Audit observation

NGCM

I checked whether NGCM was the MEP at any decommissioned metering installations and whether notification had been provided to relevant traders.

AMCI

I checked whether AMCI was the MEP at any decommissioned metering installations and whether notification had been provided to relevant traders.

Audit commentary

NGCM

There were no examples of decommissioned metering installations where the ICP was not also decommissioned.

AMCI

There were no examples of decommissioned metering installations where the ICP was not also decommissioned.

Audit outcome

Compliant

4.13. Measuring Transformer Burden and Compensation Requirements (Clause 31(4) and (5) of Schedule 10.7)

Code reference

Clause 31(4) and (5) of Schedule 10.7

Code related audit information

The MEP must, before approving the addition of, or change to, the burden or compensation factor of a measuring transformer in a metering installation, consult with the ATH who certified the metering installation.

If the MEP approves the addition of, or change to, the burden or compensation factor, it must ensure the metering installation is recertified by an ATH before the addition or change becomes effective.

Audit observation

NGCM

I asked NGCM whether they had approved any burden changes during the audit period.

AMCI

I asked AMCI whether they had approved any burden changes during the audit period.

Audit commentary

NGCM

There have not been any examples of burden changes occurring during the audit period except at the time of recertification.

AMCI

There have not been any examples of burden changes occurring during the audit period except at the time of recertification.

Audit outcome

Compliant

4.14. Changes to Software ROM or Firmware (Clause 39(1) and 39(2) of Schedule 10.7)

Code reference

Clause 39(1) and 39(2) of Schedule 10.7

Code related audit information

The MEP must, if it proposes to change the software, ROM or firmware of a data storage device installed in a metering installation, ensure that, before the change is carried out, an approved test laboratory:

- *tests and confirms that the integrity of the measurement and logging of the data storage device would be unaffected,*
- *documents the methodology and conditions necessary to implement the change,*
- *advises the ATH that certified the metering installation of any change that might affect the accuracy of the data storage device.*

The MEP must, when implementing a change to the software, ROM or firmware of a data storage device installed in a metering installation:

- *carry out the change in accordance with the methodology and conditions identified by the approved test laboratory under clause 39(1)(b)*
- *keep a list of the data storage devices that were changed,*
- *update the metering records for each installation affected with the details of the change and the methodology used.*

Audit observation

NGCM

I checked if there any examples of changes in accordance with these clauses.

AMCI

I checked if there any examples of changes in accordance with these clauses.

Audit commentary

NGCM

There have been no examples of any changes during the audit period.

AMCI

There have been no examples of any changes during the audit period.

Audit outcome

Compliant

4.15. Temporary Electrical Connection (Clause 10.29A)

Code reference

Clause 10.29A

Code related audit information

An MEP must not request that a grid owner temporarily electrically connect a POC to the grid unless the MEP is authorised to do so by the grid owner responsible for that POC and the MEP has an arrangement with that grid owner to provide metering services.

Audit observation

NGCM

NGCM is not responsible for any grid metering.

AMCI

AMCI is not responsible for any grid metering.

Audit commentary

NGCM

NGCM is not responsible for any grid metering.

AMCI

AMCI is not responsible for any grid metering.

Audit outcome

Compliant

4.16. Temporary Electrical Connection (Clause 10.30A)

Code reference

Clause 10.30A

Code related audit information

An MEP must not request that a distributor temporarily electrically connect an NSP that is not a POC to the grid unless the MEP is authorised to do so by the reconciliation participant responsible for that NSP and the MEP has an arrangement with that reconciliation participant to provide metering services.

Audit observation

NGCM

I checked if any NSPs where NGCM is the MEP had been temporarily electrically connected during the audit period.

AMCI

I checked if any NSPs where AMCI is the MEP had been temporarily electrically connected during the audit period.

Audit commentary

NGCM

There were no temporary electrical connections of NSPs where NGCM is the MEP during the audit period.

AMCI

There were no temporary electrical connections of NSPs where AMCI is the MEP during the audit period.

Audit outcome

Compliant

4.17. Temporary Electrical Connection (Clause 10.31A)

Code reference

Clause 10.31A

Code related audit information

Only a distributor may, on its network, temporarily electrically connect an ICP that is not an NSP. A MEP may only request the temporary electrical connection of the ICP if it is for the purpose of certifying a metering installation, or for maintaining, repairing, testing, or commissioning a metering installation at the ICP.

Audit observation

NGCM

I checked if there were any temporary electrical connections for NGCM.

AMCI

I checked if there were any temporary electrical connections for AMCI.

Audit commentary

NGCM

NGCM stated that there were no temporary electrical connections during the audit period.

AMCI

AMCI stated that there were no temporary electrical connections during the audit period.

Audit outcome

Compliant

5. METERING RECORDS

5.1. Accurate and Complete Records (Clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4)

Code reference

Clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4

Code related audit information

The MEP must, for each metering installation for which it is responsible, keep accurate and complete records of the attributes set out in Table 1 of Schedule 11.4. These include:

- *a) the certification expiry date of each metering component in the metering installation*
- *b) all equipment used in relation to the metering installation, including serial numbers and details of the equipment's manufacturer,*
- *c) the manufacturer's or (if different) most recent test certificate for each metering component in the metering installation*
- *d) the metering installation category and any metering installations certified at a lower category,*
- *e) all certification reports and calibration reports showing dates tested, tests carried out, and test results for all metering components in the metering installation,*
- *f) the contractor who installed each metering component in the metering installation*
- *g) the certification sticker, or equivalent details, for each metering component that is certified under Schedule 10.8 in the metering installation:*
- *h) any variations or use of the 'alternate certification' process*
- *i) seal identification information*
- *j) any applicable compensation factors,*
- *k) the owner of each metering component within the metering installation*
- *l) any applications installed within each metering component,*
- *m) the signed inspection report confirming that the metering installation complies with the requirements of Part 10.*

Audit observation

NGCM

I checked certification records for 65 metering installations to evaluate compliance with this clause.

AMCI

I checked certification records for 65 metering installations, and I also checked five inspection records to evaluate compliance with this clause.

Audit commentary

NGCM

I checked the content of 66 certification reports and found a number of missing or inaccurate fields. The table below shows the results.

		Number of incorrect or missing fields			
Clause	**Field required**	**Accucal (2)**	**Delta (20)**	**AMS (28)**	**Wells (15)**
10.9(3)(b) & Clause 10 of Schedule 10.4 & Clause 8(2)(c) of Schedule 10.7	All services access interfaces and conditions under which each may be used.	2			
9(1)(c) of Schedule 10.7	Record of increment in register value of accumulation of pulses over a measured time. Record that the register has advanced.		1	12	
2(1)(e) of Schedule 10.8	For CT certification reports, determine and record the range that the in-service burden must be within.	1			
6(4) of Schedule 10.7	Certification as a lower category detail			4	1
8(2) of Schedule 10.7	Whether the installation is HHR or NHH or both	2			
11(5)(e) of Schedule 10.7	Details of tests and checks to confirm the integrity of the installation		1	12	
17(1) of Schedule 10.7	Installation certification date or expiry date	1			4
26(4) of Schedule 10.7	Maximum interrogation cycle	2			15
9(1)(c)(i)(A) of Schedule 10.7	Raw meter data output test load greater than 5% for Cat 1		1	12	
Table 3	Prevailing load test conducted using a working standard for Category 1 recertification without meter replacement.		2	2	2
	Total number	**8**	**5**	**42**	**22**

Not all of the points above are mentioned in Clause 4 of Schedule 10.6, therefore I've also recorded non-compliance in **section 2.5**, which requires participants to ensure information is complete and accurate.

AMA has regularly met with the ATHs to work on improving the quality of information recorded in certification reports. The number of errors found in certification reports from ATHs has decreased since the last audit. The Delta ATH has included recording of pulses during Category 1 raw meter data testing since October 2022. The burden range issue has been resolved with the ATHs now recording burden range in their certification reports.

AMCI

Some issues were identified with the content of certification reports as follows:

		Number of incorrect or missing fields		
Clause	**Field required**	**Accucal (28)**	**Delta (3)**	**AMS (34)**
26(4) of Schedule 10.7	Maximum interrogation cycle	22		34
2(1)(e) of Schedule 10.8	For CT certification reports, determine and record the range that the in-service burden must be within	11		
6(4) of Schedule 10.7	Certification as a lower category detail			1
	Total number	**33**	**1**	**34**

There is a high number of discrepancies between the maximum interrogation cycle being recorded on the registry by AMCI and what is recorded in the certification reports by the ATHs. I repeat the recommendation from the last audit that AMCI work with the ATHs to clarify the maximum interrogation cycles for its meters and ensure that this is recorded accurately in certification reports.

Recommendation	Description	Audited party comment	Remedial action
Regarding clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	AMCI work with the ATHs to clarify the maximum interrogation cycles for its meters and ensure that this is recorded accurately in certification reports.	Vector metering agrees with this recommendation and will action it.	Identified

The five inspection reports I checked were signed and contained the required information.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.1 With: Clause 4(1) of Schedule 10.6 From: 01-Nov-22 To: 29-May-23	**NGCM** and **AMCI** Some inaccurate certification records. Potential impact: Medium Actual impact: Low Audit history: Three times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate because instruction has been provided to ATHs, but there is further work to be done. There is a minor impact on other participants; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
The identified issues will be reviewed and corrected where required.	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to review this area and further reinforce with its ATHs this requirement and determine how this can be monitored and, where issues are identified, raised with its ATHs promptly	Ongoing	

5.2. Inspection Reports (Clause 4(2) of Schedule 10.6)

Code reference

Clause 4(2) of Schedule 10.6

Code related audit information

The MEP must, within ten business days of receiving a request from a participant for a signed inspection report prepared under clause 44 of Schedule 10.7, make a copy of the report available to the participant.

Audit observation

NGCM

I asked NGCM whether any requests had been made for copies of inspection reports.

AMCI

I asked AMCI whether any requests had been made for copies of inspection reports.

Audit commentary

NGCM

NGCM has not been requested to supply any inspection reports.

AMCI

AMCI has signed inspection reports, and these can be provided as required. Most participants have access to AMCI's web portal.

AMCI has not been requested to supply any inspection reports.

Audit outcome

Compliant

5.3. Retention of Metering Records (Clause 4(3) of Schedule 10.6)

Code reference

Clause 4(3) of Schedule 10.6

Code related audit information

The MEP must keep metering installation records for 48 months after any metering component is removed, or any metering installation is decommissioned.

Audit observation

NGCM

I checked the NGCM record keeping processes to confirm compliance.

AMCI

I checked the AMCI record keeping processes to confirm compliance.

Audit commentary

NGCM

NGCM intends to keep records indefinitely and the ATHs are required to keep them for seven years after the installation is decommissioned or components are removed.

AMCI

AMCI intends to keep records indefinitely and the ATHs are required to keep them for seven years after the installation is decommissioned or components are removed.

Audit outcome

Compliant

5.4. Provision of Records to ATH (Clause 6 Schedule 10.6)

Code reference

Clause 6 Schedule 10.6

Code related audit information

If the MEP contracts with an ATH to recertify a metering installation and the ATH did not previously certify the metering installation, the MEP must provide the ATH with a copy of all relevant metering records not later than ten business days after the contract comes into effect.

Audit observation

NGCM

NGCM will comply with this requirement as it arises. There are no current examples where this has occurred.

AMCI

AMCI will comply with this requirement as it arises. There are no current examples where this has occurred. ATHs can access records from a web portal for jobs in progress.

Audit commentary

NGCM

NGCM will comply with this requirement as it arises. There are no current examples where this has occurred.

AMCI

AMCI will comply with this requirement as it arises. There are no current examples where this has occurred. ATHs can access records from a web portal for jobs in progress.

Audit outcome

Compliant

6. MAINTENANCE OF REGISTRY INFORMATION

6.1. MEP Response to Switch Notification (Clause 1(1) of Schedule 11.4)

Code reference

Clause 1(1) of Schedule 11.4

Code related audit information

Within ten business days of being advised by the registry manager that it is the gaining MEP for the metering installation for the ICP, the MEP must enter into an arrangement with the trader and advise the registry manager it accepts responsibility for the ICP and of the proposed date on which it will assume responsibility.

Audit observation

NGCM

I checked the switch breach history detail report to confirm whether all responses were within ten business days.

AMCI

I checked the switch breach history detail report to confirm whether all responses were within ten business days.

Audit commentary

NGCM

The switch breach history report for the audit period identified seven ICPs where the NGCM response was later than ten days. NGCM has automated the MEP switch acceptance process based on certain NSPs where they approve the installation of their metering. This means the switch acceptance timeframes are expected to be mostly immediate. If a nomination is received for an NSP where NGCM does not install metering, it is rejected. The seven late responses were all identified in exception reporting and manually processed. NGCM has implemented a process where exceptions are reviewed daily which is aimed to prevent further late acceptances.

AMCI

The switch breach history report for the audit period identified seven ICPs where the AMCI response was later than ten days and three nominations where there had been no response. The AMCI process is to not accept nominations unless a service request is received from the trader. Daily reporting from the registry is used to identify new nominations and traders are contacted where nominations are received without service requests. The seven late responses were due to delays in receiving the service requests. Of the three nominations with no response, one has been accepted, one has been rejected and the other is being followed up with the trader.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.1 With: 1(1) of Schedule 11.4 From: 04-Nov-22 To: 26-May-23	**NGCM** Seven late MN files. **AMCI** Ten late MN files. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong as the processes to identify and accept identify nominations are robust. The impact is low; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Timeliness issues that have already occurred are unable to be resolved	NA	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to monitor systems that run required processes to ensure issues are identified in a timely manner	Ongoing	

6.2. Provision of Registry Information (Clause 7 (1) (1A), (2) and (3) of Schedule 11.4)

Code reference

Clause 7 (1), (2) and (3) of Schedule 11.4

Code related audit information

The MEP must provide the information indicated as being 'required' in Table 1 of clause 7 of Schedule 11.4 to the registry manager, in the prescribed form for each metering installation for which the MEP is responsible.

The MEP does not need to provide 'required' information if the information is only for the purpose of a distributor direct billing consumers on its network.

From 1 April 2015, a MEP is required to ensure that all the registry metering records of its category 1 metering installations are complete, accurate, not misleading or deceptive, and not likely to mislead or deceive.

The information the MEP provides to the registry manager must derive from the metering equipment provider's records or the metering records contained within the current trader's system.

Audit observation

NGCM

I checked the audit compliance report and the list file to identify discrepancies.

AMCI

I checked the audit compliance report and the list file to identify discrepancies.

Audit commentary

NGCM

Analysis of the audit compliance report and list file for all ICPs found some discrepancies. The table below shows these and includes a comparison with the previous audit results.

	Quantity							
Issue	**Oct 2017**	**Oct 2018**	**Jul 2019**	**Jan 2020**	**Jan 2021**	**Sep 2021**	**Jul 2022**	**May 2023**
NGCM is recorded on the registry as the MEP, but the metering records have not been populated on the registry.	16	17	27	27	18	27	26	**17**
Category 1 ICPs with CTs installed, or with compensation factors, indicating an incorrect Category. All four were corrected at time of audit.	15	12	0	0	3	0	1	**4**
Compensation factor of 3, certified after 29 August 2013. These are all historic and all have cancelled certification. No	4	5	14	37	33	32	31	**28**

additional examples were identified.								
Category 3 ICPs have an RPS profile, indicating an incorrect metering category.	0	0	0	0	0	0	0	**0**
HHR profile with NHH installation type. Trader has incorrect profile.	0	12	2	1	5	6	4	**8**
Category 2 interim certified.	53	38	33	0	0	23	24	**21**
Day + Night not equal to 24. Five are repeated from last audit, all have Day and two Night. One of the Nights should be a different code. 11 were entered incorrectly and have now been corrected.	3	0	0	5	5	5	10	**16**
Day with no night. All four have now been corrected	20	6	67	3	1	1	2	**4**
Night with no day.	530	325	346	230	182	167	153	**172**
ICPs have "IN24". The Authority has indicated this combination should not be used.	64,650	65,535	303,667	245,803	2	1	0	**9**

All nine have now been corrected								
ICPs have CN only (residential only). One ICP is correct the rest are incorrect.	286	201	186	76	85	90	80	**38**
Category 2 or above without CTs. Four ICPs have been corrected.	101	88	73	57	49	57	65	**40**
Incorrect certification expiry.	7	9	6	12	7	7	7	**8**
Incorrect certification date.	1	4	0	0	2	0	0	**2**
Invalid ATH recorded. (VEMS identifier used after 28 September 2018). Five were certified during the audit period.	0	0	0	209	233	296	8	**239**
No control device for register content requiring a control device (excluding AMI where the control device may be internal).	3,304	3,092	2,819	4,157	4,498	4,805	3,686	**3,241**
No control device for IN register content (excluding AMI where the control	400	368	289	692	679	823	955	**1,076**

device may be internal).								
Control device installed, register content UN.	-	-	-	9,353	20,631	20,377	9,193	**9,298**

AMCI

Analysis of the audit compliance report and list file for all ICPs found some discrepancies. The table below shows these and includes a comparison with the previous audit results.

	Quantity							
Issue	**Oct 2017**	**Oct 2018**	**Jul 2019**	**Jan 2020**	**Jan 2021**	**Sep 2021**	**Jul 2022**	**May 2023**
AMCI is recorded on the registry as the MEP, but the metering records have not been populated on the registry. Two are unmetered, 23 have been updated.	0	0	5	29	21	17	32	**36**
Category 3, 4 or 5 installations "interim certified".	0	0	0	0	0	0	0	**0**
HHR profile but NHH metering installation.	0	0	0	0	0	0	1	**0**
Category 5 with a certification period longer than 3 years. Corrected.	0	0	0	0	0	0	0	**1**
Category 4 with incorrect certification duration.	0	2	5	6	15	5	4	**5**

One has been corrected.								
Category 3 with certification period longer than ten years.	0	2	1	1	3	2	1	**1**
Category 2 with incorrect certification duration. Corrected.	0	2	1	1	4	5	5	**2**
Category 1 with incorrect certification duration.	0	2	3	2	1	1	0	**0**
Incorrect certification date.	0	0	0	0	0	0	0	**1**
Over Category 1 with no measuring transformers on the registry. Corrected.	1	2	0	2	1	0	4	**1**
Incorrect compensation factors.	3	Refer to section 7.14	Refer to section 7.14	0	0	0	0	**0**
Incorrect ATH identifier on the registry. 312 with VEMS identifier used after 28 Sept 2018, 214 of these were certified in the audit period. 14 with certification numbers that do not match the ATH's numbering format.	0	3	4	41	11	89	66	**326**
Incorrect certification	-	-	-	-	40	5	11	**16**

variation of alternative recorded in registry. All have been corrected.								
Control device installed, register content UN.	-	-	-	215	210	212	186	**194**

As recorded in **section 7.1** there were 45 metering installations recertified by AMCI, but details of the certifications were not uploaded to the registry. Further investigation found that some of these were due to the operator not ticking an upload field and some were due to date discrepancies in the effective date field.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.2 With: Clause 7 (1), (2) and (3) of Schedule 11.4 From: 01-Nov-22 To: 29-May-23	**NGCM** and **AMCI** Some registry records were incomplete or incorrect. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate in this area. There are still a small number of areas where improvements can be made. Some of the discrepancies have a moderate impact on participants, customers or settlement. The relevant ones in this regard are tariff related. The audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
All identified accuracy issues are in the process of being corrected. Timeliness issues that have already occurred are unable to be resolved	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

Vector Metering will continue to review processes to ensure data is complete and accurate and implement a process to monitor and resolve issues are identified and amended in a timely fashion, and strengthen its controls.	31/12/2023	

6.3. Correction of Errors in Registry (Clause 6 of Schedule 11.4)

Code reference

Clause 6 of Schedule 11.4

Code related audit information

By 0900 hours on the 13th business day of each reconciliation period, the MEP must obtain from the registry:

- *a list of ICPs for the metering installations the MEP is responsible for*
- *the registry metering records for each ICP on that list.*

No later than five business days following collection of data from the registry, the MEP must compare the information obtained from the registry with the MEP's own records.

Within five business days of becoming aware of any discrepancy between the MEP's records and the information obtained from the registry, the MEP must correct the records that are in error and advise the registry of any necessary changes to the registry metering records.

Audit observation

NGCM

I conducted a walkthrough of the validation processes to confirm compliance. I checked all records in the audit compliance report to confirm whether the timeliness requirements were being met.

AMCI

I conducted a walkthrough of the validation processes to confirm compliance. I checked all records in the audit compliance report to confirm whether the timeliness requirements were being met.

Audit commentary

NGCM

NGCM demonstrated its registry validation processes. A registry file is downloaded, and exception reports are produced daily. The majority of exceptions are corrected on the day they are identified. Whilst the process is robust and the requirement to complete validation is met, some discrepancies are not able to be corrected within five business days, which is recorded as non-compliance.

AMCI

AMCI downloads a registry file weekly which is compared to its own records in Service Max. Reports are produced which identify any discrepancies that are identified. These reports are worked through, and discrepancies are corrected though this is not always able to be completed within five business days as required. Compliance is achieved with the requirement to conduct a complete validation as required by this clause. However, non-compliance is recorded as discrepancies are not always resolved within five business days.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.3 With: Clause 6 of Schedule 11.4 From: 01-Nov-22 To: 29-May-23	**NGCM** and **AMCI** Discrepancies not resolved within five business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate in this area. There are still a small number of areas where improvements can be made. 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
All identified accuracy issues are in the process of being corrected.	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will look at its process to identify any opportunities to improve its performance and strengthen its controls. However, we note that we are heavily reliant on other participants completing their activities before we can undertake amendments.	31/12/2023	

6.4. Cancellation of Certification (Clause 20 of Schedule 10.7)

Code reference

Clause 20 of Schedule 10.7

Code related audit information

The certification of a metering installation is automatically cancelled on the date on which one of the following events takes place:

- *a) the metering installation is modified otherwise than under sub clause 19(3), 19(3A) or 19(3C)*
- *b) the metering installation is classed as outside the applicable accuracy tolerances set out in Table 1 of Schedule 10.1, defective or not fit for purpose under this Part or any audit,*
- *c) an ATH advises the metering equipment provider responsible for the metering installation of a reference standard or working standard used to certify the metering installation not being compliant with this Part at the time it was used to certify the metering installation, or the failure of a group of meters in the statistical sampling recertification process for the metering installation, or the failure of a certification test for the metering installation,*

d) the manufacturer of a metering component in the metering installation determines that the metering component does not comply with the standards to which the metering component was tested,

e) an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part,

f) if the metering installation has been determined to be a lower category under clause 6 and:

(i) the MEP has not received the report under 6(2A)(a) or 6(2A)(b); or

(ii) the report demonstrates the maximum current is higher than permitted; or

(iii) the report demonstrates the electricity conveyed exceeds the amount permitted,

g) the metering installation is certified under clause 14 and sufficient load is available for full certification testing and has not been retested under clause 14(4)

h) a control device in the metering installation certification is, and remains for a period of at least ten business days, bridged out under clause 35(1)

i) the metering equipment provider responsible for the metering installation is advised by an ATH under clause 48(6)(b) that a seal has been removed or broken and the accuracy and continued integrity of the metering installation has been affected.

j) the installation is an HHR AMI installation certified after 29 August 2013 and

(i) the metering installation is not interrogated within the maximum interrogation cycle; or

(ii) the HHR and NHH register comparison is not performed; or

(iii) the HHR and NHH register comparison for the same period finds a difference of greater than 1 kWh and the issue is not remediated within three business days.

A metering equipment provider must (unless the installation has been recertified within the ten business days) within ten business days of becoming aware that one of the events above has occurred in relation to a metering installation for which it is responsible, update the metering installation's certification expiry date in the registry.

If any of the events in Clause 20(1)(j) of Schedule 10.7 have occurred, update the AMI flag in the registry to 'N'.

Audit observation

NGCM

I checked for examples of all the points listed above, and checked whether certification had been cancelled, and whether the registry had been updated within ten business days.

AMCI

I checked for examples of all the points listed above, and checked whether certification had been cancelled, and whether the registry had been updated within ten business days.

Audit commentary

NGCM

I checked all of the points mentioned above as follows.

Inspection

I checked the registry records to identify Category 2 ICPs where inspections were due. 383 metering installations were due for inspection during the audit period and inspections were not conducted. I have recorded non-compliance as certification was not cancelled within ten business days of the maximum inspection period for all 383 metering installations.

Low Burden

I checked the three ICPs which were identified in the last audit as not cancelled following certification with low burden. Certification has now been cancelled though I have included the details of these below as cancellation was not done within ten business days.

Low burden from the previous audits			
ICP	**ATH**	**Certification date**	**Cancellation date**
0089217802PC769	Wells	19 March 2021	22 February 2023
0001731321TGD94	Wells	10 February 2021	21 February 2023
0000194732TR969	Wells	1 July 2021	21 February 2023

Analysis of the certification records for 35 Category 2 metering installations found none were certified with burden lower than the lowest test point.

Bridged control devices

NGCM provided a list of 15 bridged control devices. I checked all 15 examples, and in all cases, the appropriate notification was provided. 14 of the 15 ICPs did not have profiles requiring the operation of control devices. In one example where the profile required the operation of the control device the control device was replaced within ten business days.

Not read during maximum interrogation cycle

As recorded in **section 10.5**, all ICPs not read within the maximum interrogation cycle had the AMI flag set to "N".

Sum-check Failure

I checked for examples where meters had not passed sum-check, were not resolved within three business days and certification was not cancelled within ten business days. As recorded in **section 10.9**, NGCM has a process to identify sum-check failures and cancel certification if not resolved within three business days. The reporting provided by NGCM identified five meters that had failed sum-check and were not resolved within three business days. The registry was updated with the cancellation of certification within ten business days for all five ICPs. Compliance is confirmed.

Bridged meters

I checked a sample of 15 examples of bridged meters, 12 of the 15 were either recertified or cancelled within ten business days of being bridged. Three of the 15 examples were not cancelled within ten business days as detailed in the table below. Bridged meters are discussed further in **section 9.5.**

ICP	Date bridged	Date registry updated with cancellation	Number of business days to cancel
0007207395RN4CE	19 February 2023	14 March 2023	15
0000018643CP7F7	2 February 2023	23 February 2023	14
0000714805NVE57	25 October 2022	1 December 2022	27

AMCI

I checked all of the points mentioned above as follows.

Inspection

I checked the registry information and determined that there were 468 metering installations at categories 2, 3, 4 and 5 that were due for inspection during the audit period. 326 of these were either inspected, recertified within the maximum inspection period or had certification cancelled prior to ten days after the latest inspection due date. There were 142 metering installations where inspections were not completed within the maximum inspection period and certification was not cancelled within ten business days. I have recorded non-compliance for these 142 metering installations.

Certification at a lower category

I checked the list maintained by AMCI of installations requiring monitoring and confirmed that monitoring had taken place each month. Compliance is confirmed.

Insufficient load certification

Clause 14 of Schedule 10.7 requires the MEP to ensure that the ATH returns to site to complete testing no later than 20 business days after sufficient load is identified when monitoring metering installations certified with insufficient load. Sufficient load was identified for one example at ICP 1002178201UNA4C, AMCI advised the ATH to return and complete tests but due to problems gaining access the ATH was not able to complete the testing within 20 business days. I have recorded non-compliance in **section 7.7** as the MEP did not arrange for the ATH to complete testing within 20 business days. Non-compliance is recorded in this section as the certification was not cancelled within ten days. The ATH subsequently went to site and completed testing and recertified the metering installation. Details of his case are included in the table below.

ICP	Date of insufficient load certification	Date sufficient load identified	Date testing completed and installation recertified	Business days to cancel certification
1002178201UNA4C	10 May 2023	25 May 2023	18 July 2023	16

Low burden

I checked and confirmed that all ICPs from previous audits where certification was cancelled due to low burden have been recertified and the registry updated.

Analysis of the certification records for 64 Category 2 and above metering installations found none were certified with burden lower than the lowest test point during the audit period.

Metering installation is defective or not fit for purpose

AMCI provided details of a faulty high voltage metering installation at ICP 0000880342WE7D0. In this case the ATH went to site on 21st December 2022 and determined that the voltage transformer was faulty. A statement of situation was provided on 10th January 2023. AMCI did not cancel the certification on the registry until the metering installation was repaired and recertified on 1st April 2023. I have recorded non-compliance as the registry was not updated with cancelled certification within ten business days.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 6.4 With: Clause 6 of Schedule 11.4 From: 01-Nov-22 To: 18-Jul-23	Certification cancelled, and registry not updated within ten business days for: **NGCM** • three installations with low burden, • three bridged meters, and • 383 Category 2 installations with inspection not conducted. **AMCI** • 142 installations with inspection not conducted, • one installation with testing not conducted within 20 business days of sufficient load being identified, and • one faulty metering installation. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2

Audit risk rating	Rationale for audit risk rating
Low	I have recorded the controls as moderate in this area as there is room for improvement. The responsibility for the MEP is to cancel certification on the registry once they know certification is cancelled and the impact of not doing this is minor, therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
All identified instances are in the process of being corrected on the Registry	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to review its processes and training to ensure certifications are cancelled on the Registry.	Ongoing	

6.5. Registry Metering Records (Clause 11.8A)

Code reference

Clause 11.8A

Code related audit information

The MEP must provide the registry manager with the required metering information for each metering installation the MEP is responsible for and update the registry metering records in accordance with Schedule 11.4.

Audit observation

NGCM

This clause refers to schedule 11.4 which is discussed in **section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of NGCM not using the prescribed form.

AMCI

This clause refers to schedule 11.4 which is discussed in **section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of AMCI not using the prescribed form.

Audit commentary

NGCM

This clause refers to schedule 11.4 which is discussed in **section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of NGCM not using the prescribed form and did not find any exceptions.

AMCI

This clause refers to schedule 11.4 which is discussed in **section 6.2**, apart from the requirement to provide information in the "prescribed form". I checked for examples of AMCI not using the prescribed form and did not find any exceptions.

Audit outcome

Compliant

7. CERTIFICATION OF METERING INSTALLATIONS

7.1. Certification and Maintenance (Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7)

Code reference

Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7

Code related audit information

The MEP must obtain and maintain certifications for all installations and metering components for which it is responsible. The MEP must ensure it:

- *performs regular maintenance, battery replacement, repair/replacement of components of the metering installations,*
- *updates the metering records at the time of the maintenance,*
- *has a recertification programme that will ensure that all installations are recertified prior to expiry.*

Audit observation

NGCM

I conducted the following checks to identify metering installations with expired, cancelled or late certification:

- the audit compliance report was checked to identify ICPs with expired certification,
- the new connections process was checked by using the event detail report, PR255 and the list file to identify ICPs where the certification was not conducted within five business days of energisation, and
- I checked ICPs where certification was cancelled to ensure the registry was updated accordingly.

AMCI

I conducted the following checks to identify metering installations with expired, cancelled or late certification:

- the audit compliance report was checked to identify ICPs with expired certification,
- the new connections process was checked by using the event detail report, PR255 and the list file to identify ICPs where the certification was not conducted within five business days of energisation, and
- I checked ICPs where certification was cancelled to ensure the registry was updated accordingly.

Audit commentary

NGCM

At the time of my analysis, NGCM had 7,914 previously fully certified ICPs with expired or cancelled certification and 17,737 previously interim certified installations that have now expired. 1,687 of the expired certifications are Category 2 installations.

As recorded in **section 6.4**, three ICPs have cancelled certification and the registry has not been updated.

NGCM provided details of compliance projects currently in progress to recertify cancelled and expired metering installations. In the last two months an average of 1,500 Category 1 and 120 Category 2 metering installations were certified. NGCM are experiencing a high number of "unable to complete" jobs being

returned from the field due to access and electrical installation compliance issues; this is averaging approximately 500 per month.

I also checked NGCM's records and the Network Supply Points Table on the Authority's website and confirmed that the two NSPs with NGCM metering had current certification.

AMCI

The audit compliance report identified 415 ICPs with expired full certification as detailed in the table below:

Category	Number of expired or cancelled certifications
1	201
2	28
3	98
4	79
5	9

45 of the expired certifications have been recertified and are recorded in the AMCI systems as such. Details of the new certification information had not been added to the registry due to issues with the AMCI systems, this is also recorded in **section 6.2**.

AMCI provided comments on a number of the expired or cancelled certifications which are summarised in the following table.

Number of ICPs	AMCI comments
197	Site being upgraded from legacy to NHH AMI NGCM - project underway
66	Customer issues, Health and safety and/or access problems
26	3rd party asset requiring calibration/certification
3	ICPs have been decommissioned
71	Certification jobs issued to ATHs
4	AMCI following up as no certification jobs have been issued

I also checked the Network Supply Points Table on the Authority's website and confirmed that AMCI is responsible for the metering at 303 NSPs. There were 20 of the 303 NSPs which were recorded as having expired certification.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.1 With: Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7 From: 12-Aug-14 To: 29-May-23	**NGCM** Certification expired or cancelled for 25,654 NGCM metering installations. **AMCI** Certification expired for 435 AMCI metering installations. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	I have recorded the controls as moderate in this area because certification has been expired for a number of years for some ICPs and because some of the expired installations were fully certified at one point. The impact on settlement is recorded as moderate because of the increased likelihood of failure or inaccuracy for metering installations with expired certification. The audit risk rating is recorded as medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Vector Metering has been actively working with the Electricity Authority separately to this audit process on resolving the expired certifications issues. Vector Metering has an established program of work with clear and continual monitoring. Progress continues to be positive and is tracking in accordance with commitments made. Issues such as technician resourcing, access to properties (e.g. customer refusal, vacancy, or another MEP nominated), and safety (VIR, ACM, gas proximity) continue to be present. Solutions for the installations that are unable to be certified are continually being worked on in conjunction with traders, ATHs, and metering vendors.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
See above		

7.2. Certification Tests (Clause 10.38(b) and clause 9 of Schedule 10.6)

Code reference

Clause 10.38(b) and clause 9 of Schedule 10.6

Code related audit information

For each metering component and metering installation an MEP is responsible for, the MEP must ensure that:

- *an ATH performs the appropriate certification and recertification tests,*
- *the ATH has the appropriate scope of approval to certify and recertify the metering installation.*

Audit observation

NGCM

I checked the certification records for 65 metering installations to confirm compliance. ATHs have shown that their processes include all tests, and reports confirm tests are completed.

AMCI

I checked the certification records for 66 metering installations to confirm compliance. ATHs have shown that their processes include all tests, and reports confirm tests are completed.

Audit commentary

NGCM

As recorded in **section 5.1**, there are some tests not conducted by ATHs and some tests with results not recorded and therefore it is not confirmed the tests were conducted. The issues are recorded in the table below. The processes for the AMS ATH have shown that the tests are conducted but results are not recorded. The Delta ATH has included recording of pulses during Category 1 raw meter data testing since October 2022. The requirement to conduct a prevailing load test using a working standard to re-certify an installation with existing components was not met by the Delta, AMS and Wells ATHs in all six examples checked. There was one example at ICP 1000587068PCBBD, where one of two meters was replaced, and the metering installation was recertified but no testing was conducted on the existing meter as required by Table 3.

		Number of incorrect or missing fields			
Clause	**Field required**	**Accucal (2)**	**Delta (20)**	**AMS (28)**	**Wells (15)**
9(1)(c) of Schedule 10.7	Record of increment in register value of accumulation of pulses over a measured time. Record that the register has advanced.		1	9	1
11(5)(e) of Schedule 10.7	Details of tests and checks to confirm the integrity of the installation		1	9	
9(1)(c)(i)(A) of Schedule 10.7	Raw meter data output test load greater than 5% for Cat 1		1	9	1
Table 3 of Schedule 10.1	Prevailing load test conducted using a working standard for recertification without meter replacement.		2	2	2

AMCI

My checks of 66 certification records confirmed that the ATHs had conducted all required testing and recorded the results in the metering installation certification reports.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.2 With: Clause 10.38(b) and clause 9 of Schedule 10.6 From: 01-Nov-22 To: 29-May-23	**NGCM** Some certification tests were not conducted by ATHs. Potential impact: Medium Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong because the main test not conducted is prevailing load using a working standard to recertify an installation with existing components. Other testing confirms the integrity of the installation, and the industry has the view that this test is not required. 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
Vector Metering does not believe a prevailing load is required in Certified BTS>Perm situations and will look to seek clarification from the Authority	30/09/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Where we believe prevailing load test is required, our policy is to replace meters as the test houses do not have provision of expensive equipment to undertake this testing.	Ongoing	

7.3. Active and Reactive Capability (Clause 10.37(1) and 10.37(2)(a))

Code reference

Clause 10.37(1) and 10.37(2)(a)

Code related audit information

For any category 2 or higher half-hour metering installation that is certified after 29 August 2013, the MEP must ensure that the installation has active and reactive measuring and recording capability.

Consumption only installations that is a category 3 metering installation or above must measure and separately record:

a) *import active energy,*
b) *import reactive energy,*
c) *export reactive energy.*

Consumption only installations that are a category 2 metering installation must measure and separately record import active energy.

All other installations must measure and separately record:

a) *import active energy,*
b) *export active energy,*
c) *import reactive energy,*
d) *export reactive energy.*

All grid connected POCs with metering installations which are certified after 29 August 2013 should measure and separately record:

a) *import active energy,*
b) *export active energy,*
c) *import reactive energy,*
d) *export reactive energy.*

Audit observation

NGCM

I checked the certification records for 35 metering installations to confirm compliance.

AMCI

I checked the certification records for 64 metering installations to confirm compliance.

Audit commentary

NGCM

Category 2 AMI metering installations are predominantly "consumption only" and therefore the meters are required to measure and separately record export reactive energy. The data storage devices are capable of this but are not configured this way, however compliance is achieved because the Code does not require the reactive energy channel to be interrogated and returned.

AMCI

All metering installed since 29 August 2013 record all four quadrants.

Audit outcome

Compliant

7.4. Local Service Metering (Clause 10.37(2)(b))

Code reference

Clause 10.37(2)(b)

Code related audit information

The accuracy of each local service metering installation in grid substations must be within the tolerances set out in Table 1 of Schedule 10.1.

Audit observation

This clause relates to Transpower as an MEP.

Audit commentary

This clause relates to Transpower as an MEP.

Audit outcome

Not applicable

7.5. Measuring Transformer Burden (Clause 30(1) and 31(2) of Schedule 10.7)

Code reference

Clause 30(1) and 31(2) of Schedule 10.7

Code related audit information

The MEP must not permit a measuring transformer to be connected to equipment used for a purpose other than metering, unless it is not practical for the equipment to have a separate measuring transformer.

The MEP must ensure that a change to, or addition of, a measuring transformer burden or a compensation factor related to a measuring transformer is carried out only by:

a) the ATH who most recently certified the metering installation
b) for a POC to the grid, by a suitably qualified person approved by both the MEP and the ATH who most recently certified the metering installation.

Audit observation

NGCM

I asked NGCM if there were any examples of burden changes or the addition of non-metering equipment being connected to metering CTs.

AMCI

I asked AMCI if there were any examples of burden changes or the addition of non-metering equipment being connected to metering CTs.

Audit commentary

NGCM

There are no examples of burden changes having occurred. In **section 6.4** I have recorded non-compliance due to three previous examples of low burden not being addressed.

AMCI

There are no examples of burden changes having occurred.

Audit outcome

Not applicable

7.6. Certification as a Lower Category (Clauses 6(1)(b) and (d), and 6(2)(b) of Schedule 10.7)

Code reference

Clauses 6(1)(b) and (d), and 6(2)(b) of Schedule 10.7

Code related audit information

A category 2 or higher metering installation may be certified by an ATH at a lower category than would be indicated solely on the primary rating of the current if the MEP, based on historical metering data, reasonably believes that:

- *the maximum current will at all times during the intended certification period be lower than the current setting of the protection device for the category for which the metering installation is certified, or is required to be certified by the Code; or*
- *the metering installation will use less than 0.5 GWh in any 12-month period.*

If a metering installation is categorised under clause 6(1)(b), the ATH may, if it considers appropriate, and, at the MEP's request, determine the metering installation's category according to the metering installation's expected maximum current.

If a meter is certified in this manner:

- *the MEP must, each month, obtain a report from the participant interrogating the metering installation, which details the maximum current from raw meter data from the metering installation by either calculation from the kVA by trading period, if available, or from a maximum current indicator if fitted in the metering installation conveyed through the point of connection for the prior month; and*
- *if the MEP does not receive a report, or the report demonstrates that the maximum current conveyed through the POC was higher than permitted for the metering installation category it is certified for, then the certification for the metering installation is automatically cancelled.*

Audit observation

NGCM

I checked all ICPs for any examples where the CT ratio was above the threshold to confirm that protection was appropriate or that monitoring was in place.

AMCI

I checked all ICPs for any examples where the CT ratio was above the threshold to confirm that protection was appropriate or that monitoring was in place.

Audit commentary

NGCM

I have checked the monitoring reports for the audit period and confirm that monitoring has taken place. I checked the certification records for eight metering installations certified at a lower category during the audit period. Three of the certifications were conducted on the basis of there being a current limiting device limiting the current to within the category certified. Details of the current limiting devices were recorded by the ATH in the metering installation certification reports.

Five of certification records checked were certified based on the historical load and required that the MEP monitor load to ensure the category limit is not exceeded. I confirmed that these metering installations had been added to the monitoring list by NGM and were monitored each month. I have recorded non-compliance in **section 5.1** as the certification records did not clearly include a statement from the ATH advising the MEP of the requirement to monitor monthly to ensure that the maximum current does not exceed the category limit.

AMCI

I have checked the monitoring reports for the audit period and confirm that monitoring has taken place. I checked the certification records for a sample of two metering installations certified at a lower category during the audit period. One of the certifications was conducted on the basis of there being a current limiting device limiting the current to within the category certified. Details of the current limiting device were recorded by the ATH in the metering installation certification report.

One of the certification records checked was certified based on the historical load and required that the MEP monitor load to ensure the category limit is not exceeded. I confirmed that this metering installation had been added to the monitoring list by AMCI and was monitored each month. I have recorded non-compliance in **section 5.1** as the certification record did not clearly include a statement from the ATH advising the MEP of the requirement to monitor monthly to ensure that the maximum current does not exceed the category limit.

Audit outcome

Compliant

7.7. Insufficient Load for Certification Tests (Clauses 14(3) and (4) of Schedule 10.7)

Code reference

Clauses 14(3) and (4) of Schedule 10.7

Code related audit information

If there is insufficient electricity conveyed through a POC to allow the ATH to complete a prevailing load test for a metering installation that is being certified as a half hour meter and the ATH certifies the metering installation the MEP must:

- *obtain and monitor raw meter data from the metering installation at least once each calendar month to determine if load during the month is sufficient for a prevailing load test to be completed:*
- *if there is sufficient load, arrange for an ATH to complete the tests (within 20 business days).*

Audit observation

NGCM

I checked if there were any examples of Insufficient load certifications.

AMCI

I checked if there were any examples of Insufficient load certifications.

Audit commentary

NGCM

There were no examples of insufficient load certification during the audit period. NGCM has previously instructed ATHs that load must be added to perform certification testing and that insufficient load certification should not be conducted.

AMCI

I found eight examples of insufficient load certification during my certification report checks. All eight certification reports included a statement from the ATH advising the MEP of the requirement to monitor monthly and advise when load is available. AMCI demonstrated that monitoring is in place as required by this clause and all eight examples had been added to the monitoring last and monitoring had been taken place each month.

Sufficient load was identified for one example at ICP 1002178201UNA4C, AMCI advised the ATH to return and complete tests but due to problems gaining access the ATH was not able to complete the testing within 20 business days. I have recorded non-compliance as the MEP did not arrange for the ATH to complete testing within 20 business days. The ATH subsequently went to site and completed testing and recertified the metering installation. Non-compliance is also recorded in **section 6.4** as the certification was not cancelled within ten days. Details of his case are included in the table below.

ICP	Date of insufficient load certification	Date sufficient load identified	Date testing completed and installation recertified	Business days to complete testing and recertify
1002178201UNA4C	10 May 2023	25 May 2023	18 July 2023	36

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.7 With: Clause 14 (4) of Schedule 10.7 From: 23-Jun-23 To: 18-Jul-23	**AMCI** One metering installation with testing not conducted within 20 business days of sufficient load being identified. Potential impact: Medium Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as strong in this area as the AMCI monitoring process ensures that ATHs are advised immediately when sufficient load is identified. There was no impact on settlement and participants as testing confirmed the accuracy of the metering installation; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
No further action required as testing was conducted.	NA	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The non-compliance was access related and outside of the control of Vector Metering. Vectoring Metering will reconfirm the obligations with other participants so that they remain aware.	31/10/2023	

7.8. Insufficient Load for Certification – Cancellation of Certification (Clause 14(6) of Schedule 10.7)

Code reference

Clause 14(6) of Schedule 10.7

Code related audit information

If the tests conducted under clause 14(4) of Schedule 10.7 demonstrate that the metering installation is not within the relevant maximum permitted error:

- *the metering installation certification is automatically revoked:*
- *the certifying ATH must advise the MEP of the cancellation within 1 business day:*
- *the MEP must follow the procedure for handling faulty metering installations (clause 10.43 - 10.48).*

Audit observation

NGCM

I checked if there were any examples of tests conducted demonstrating that the metering installation is not within the relevant maximum permitted error.

AMCI

I checked if there were any examples of tests conducted demonstrating that the metering installation is not within the relevant maximum permitted error.

Audit commentary

NGCM

There are no examples of tests conducted demonstrating that the metering installation is not within the relevant maximum permitted error.

AMCI

There are no examples of tests conducted demonstrating that the metering installation is not within the relevant maximum permitted error.

Audit outcome

Compliant

7.9. Alternative Certification Requirements (Clauses 32(2), (3) and (4) of Schedule 10.7)

Code reference

Clauses 32(2), (3) and (4) of Schedule 10.7

Code related audit information

If an ATH cannot comply with the requirements to certify a metering installation due to measuring transformer access issues, and therefore certifies the metering installation in accordance with clause 32(1) of Schedule 10.7, the MEP must:

- *advise the Authority, by no later than ten business days after the date of certification of the metering installation, of the details in clause 32(2)(a) of Schedule 10.7*
- *respond, within 5 business days, to any requests from the Authority for additional information,*
- *ensure that all of the details are recorded in the metering installation certification report,*
- *take all steps to ensure that the metering installation is certified before the certification expiry date.*

If the Authority determines the ATH could have obtained access the metering installation is deemed to be defective, and the MEP must follow the process of handling faults metering installations in clauses 10.43 to 10.48.

Audit observation

NGCM

I checked the registry records to confirm whether alternative certification had been applied.

AMCI

I checked the registry records to confirm whether alternative certification had been applied.

Audit commentary

NGCM

Alternative certification has not been applied to any metering installations during the audit period.

AMCI

I checked the certification records and communications to the Authority for a sample of five metering installations certified using the alternative certification method during the audit period. In all five cases the certification records contained appropriate details and notification was sent to the Authority using the prescribed form. I have recorded non-compliance as in two of the five cases the notification to the Authority was not provided within ten business days due to delays in receiving the certification records from the ATH. Details of these are listed in the following table:

ICP	Installation number	ATH	Certification date	Notification date	Business days
0000100003WP28C	1	ACCL	22 December 2022	14 February 2023	32
0000100003WP28C	2	ACCL	22 December 2022	3 February 2023	26

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.9 With: Clauses 32(2), (3) and (4) of Schedule 10.7 From: 09-Jan-23 To: 14-Feb-23	**AMCI** Notification of alternative certification not provided to the Authority within ten business days for two 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 the controls as moderate in this area because there is room for improvement. There is no impact on participants and settlement, therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
No action required as the information has been provided	NA	Cleared

Preventative actions taken to ensure no further issues will occur	Completion date	
Vector metering will work with ATHs to ensure the delivery of certification records is not delayed meeting its own obligations.	Ongoing	

7.10. Timekeeping Requirements (Clause 23 of Schedule 10.7)

Code reference

Clause 23 of Schedule 10.7

Code related audit information

If a time keeping device that is not remotely monitored and corrected controls the switching of a meter register in a metering installation, the MEP must ensure that the time keeping device:

a) has a time keeping error of not greater than an average of 2 seconds per day over a period of 12 months,
b) is monitored and corrected at least once every 12 months.

Audit observation

NGCM

I asked NGCM whether there were any metering installations with time switches switching meter registers or any AMI metering installations with time dependant register content codes where the AMI flag had been changed to "N" for more than 12 months.

AMCI

I asked AMCI whether there were any metering installations with time switches switching meter registers or any AMI metering installations with time dependant register content codes where the AMI flag had been changed to "N" for more than 12 months.

Audit commentary

NGCM

NGCM confirmed there are no metering installations which have time switches that control meter registers.

NGCM has AMI meters with configurations using multiple registers that are remotely monitored to meet the requirements of Clause 8(4) of Schedule 10.6. In cases where AMI meters fail to communicate the MEP switches the AMI flag in the registry to "N" to avoid cancellation of certification. When the meter is not communicating its time is no longer monitored and it becomes subject to the requirements of this clause if there are registers switched by the time of meter. 809 meters with time dependent register content codes where the AMI flag had been changed to "N" due to an inability to communicate for more than 12 months were identified. I have recorded non-compliance for these ICPs as the requirement to monitor and correct time at least once every 12 months has not been met.

NGCM advised that work on a process to visit non-communicating meters to check and correct time is nearing completion. The first priority in the process will be to restore communication but in cases where this is not possible the meter time will be corrected.

AMCI

AMCI confirmed there are no metering installations that have time clocks that are not remotely read.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.10 With: Clause 23 of Schedule 10.7 From: 01-Nov-22 To: 29-May-23	**NGCM** 809 ICPs with time dependent meter registers with time that were not monitored every 12 months. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as moderate as NGCM has the capability to identify this, but regular monitoring has not taken place. The impact on settlement and participants could be minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Vector Metering will work with other participants to have the metering either remotely monitored and corrected or physically replaced.	31/12/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will review how it deals with meters where the installation is non-communicating and there is a time dependent code with a view to ensuring a physical check within each 12 months, where required	31/12/2023	

7.11. Control Device Bridged Out (Clause 35 of Schedule 10.7)

Code reference

Clause 35 of Schedule 10.7

Code related audit information

The participant must, within ten business days of bridging out a control device or becoming aware of a control device being bridged out, notify the following parties:

- *the relevant reconciliation participant*
- *the relevant metering equipment provider.*

If the control device is used for reconciliation, the metering installation is considered defective in accordance with 10.43.

Audit observation

NGCM

I checked the process for the management of bridged control devices, and I checked whether any notifications were required to other parties.

AMCI

I checked the process for the management of bridged control devices, and I checked whether any notifications were required to other parties.

Audit commentary

NGCM

As recorded in **section 6.4**, NGCM provided a list of 15 bridged control devices. I checked all 15 examples, and in all cases, the appropriate notification was provided. 14 of the 15 ICPs did not have profiles requiring the operation of control devices. In one example where the profile required the operation of the control device the control device was replaced within ten business days.

AMCI

AMCI does not have any control devices used for submission purposes.

Audit outcome

Compliant

7.12. Control Device Reliability Requirements (Clause 34(5) of Schedule 10.7)

Code reference

Clause 34(5) of Schedule 10.7

Code related audit information

If the MEP is advised by an ATH that the likelihood of a control device not receiving signals would affect the accuracy or completeness of the information for the purposes of Part 15, the MEP must, within 3 business days inform the following parties of the ATH's determination (including all relevant details):

a) the reconciliation participant for the POC for the metering installation
b) the control signal provider.

Audit observation

NGCM

I checked the steps NGCM had taken to identify regions with signal propagation issues.

AMCI

I checked the steps AMCI had taken to identify regions with signal propagation issues.

Audit commentary

NGCM

NGCM provided a comprehensive process document which achieves compliance with this clause.

AMCI

AMCI does not have any control devices used for submission purposes.

Audit outcome

Compliant

7.13. Statistical Sampling (Clauses 16(1) and (5) of Schedule 10.7)

Code reference

Clauses 16(1) and (5) of Schedule 10.7

Code related audit information

The MEP may arrange for an ATH to recertify a group of category 1 metering installations for which the MEP is responsible using a statistical sampling process.

The MEP must update the registry in accordance with Part 11 on the advice of an ATH as to whether the group meets the recertification requirements.

Audit observation

NGCM

I checked whether statistical sampling had occurred during the audit period.

AMCI

I checked whether statistical sampling had occurred during the audit period.

Audit commentary

NGCM

NGCM provided details of a recertification by statistical sampling project being undertaken by the AMS ATH to recertify 5,781 Category 1 metering installations. The ATH used a stratified sampling method which ensured that the sample was representative of the population certified. The results showed that the meters sampled passed the appropriate criteria detailed in AS/NZS 1284 and were correctly certified for a period of five years.

AMCI

AMCI does not intend to conduct statistical sampling.

Audit outcome

Compliant

7.14. Compensation Factors (Clause 24(3) of Schedule 10.7)

Code reference

Clause 24(3) of Schedule 10.7

Code related audit information

If an external compensation factor must be applied to a metering installation that is an NSP, the MEP must advise the reconciliation participant responsible for the metering installation of the compensation factor within ten days of certification of the installation.

In all other cases the MEP must update the compensation factor recorded in the registry in accordance with Part 11.

Audit observation

NGCM

I checked the records for 35 Category 2 metering installations to confirm that compensation factors were correctly recorded on the registry. I also checked the audit compliance report for unusual compensation factors.

AMCI

I checked all the records for 64 Category 2 and above metering installations to confirm that compensation factors were correctly recorded on the registry. I also checked the audit compliance report for unusual compensation factors.

Audit commentary

NGCM

Compensation factors were updated accurately on the registry for the 35 ICPs checked. No examples of incorrect compensation factors were identified by the audit compliance report.

AMCI

Compensation factors were updated accurately on the registry for the 64 ICPs checked. No examples of incorrect compensation factors were identified by the audit compliance report.

Audit outcome

Compliant

7.15. Metering Installations Incorporating a Meter (Clause 26(1) of Schedule 10.7)

Code reference

Clause 26(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each meter in a metering installation it is responsible for is certified.

Audit observation

NGCM

I checked the certification records for 65 metering installations to confirm compliance.

AMCI

I checked the certification records for 66 metering installations to confirm compliance.

Audit commentary

NGCM

I checked 65 metering installation certification records and found that meters are being certified by ATHs.

AMCI

I checked 66 metering installation certification records and found that meters are being certified by ATHs.

Audit outcome

Compliant

7.16. Metering Installations Incorporating a Measuring Transformer (Clause 28(1) of Schedule 10.7)

Code reference

Clause 28(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each measuring transformer in a metering installation it is responsible for is certified.

Audit observation

NGCM

I checked the certification records for 11 Category 2 metering installations certified using the selected component method to confirm compliance.

AMCI

I checked the certification records for 53 Category 2 and above metering installations certified using the selected component and fully calibrated methods to confirm compliance.

Audit commentary

NGCM

Measuring transformers were certified for all 11 Category 2 metering installations certified using the selected component method.

AMCI

Measuring transformers were certified for all 53 Category 2 and above metering installations certified using the selected component and fully calibrated methods.

Audit outcome

Compliant

7.17. Metering Installations Incorporating a Data Storage Device (Clause 36(1) of Schedule 10.7)

Code reference

Clause 36(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each data storage device in a metering installation it is responsible for is certified.

Audit observation

NGCM

I checked the certification records for 65 metering installations to confirm compliance.

AMCI

I checked the certification records for 66 metering installations to confirm compliance.

Audit commentary

NGCM

I checked 65 metering installation certification records and found that the data storage devices are being certified by ATHs.

AMCI

The 66 certification records that I checked confirmed that the data storage devices are being correctly certified.

Audit outcome

Compliant

7.18. Notification of ATH Approval (Clause 7 (3) Schedule 10.3)

Code reference

Clause 7 (3) Schedule 10.3

Code related audit information

If the MEP is given notice by the Authority that an ATH's approval has expired, been cancelled or been revised, the MEP must treat all metering installations certified by the ATH during the period where the ATH was not approved to perform the activities as being defective and follow the procedures set out in clauses 10.43 to 10.48.

Audit observation

NGCM

I checked the ATH register to confirm compliance.

AMCI

I checked the ATH register to confirm compliance.

Audit commentary

NGCM

All relevant ATHs have appropriate approval.

AMCI

All relevant ATHs have appropriate approval.

Audit outcome

Compliant

7.19. Interim Certification (Clause 18 of Schedule 10.7)

Code reference

Clause 18 of Schedule 10.7

Code related audit information

The MEP must ensure that each interim certified metering installation on 28 August 2013 is certified by no later than 1 April 2015.

Audit observation

NGCM

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 to identify any ICPs with interim certification recorded.

AMCI

I checked the audit compliance report for the period 1 November 2022 to 29 May 2023 to identify any ICPs with interim certification recorded.

Audit commentary

NGCM

As recorded in **section 7.1**, there are 17,737 previously interim certified metering installations where recertification did not occur by 1 April 2015.

AMCI

AMCI does not have any interim certified metering installations.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.19 With: Clause 18 of Schedule 10.7 From: 01-Apr-15 To: 29-May-23	**NGCM** 17,737 ICPs with expired interim certification. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	I have recorded the controls as moderate in this area because certification has been expired for a number of years for these ICPs. The impact on settlement is recorded as moderate because of the increased likelihood of failure or inaccuracy for metering installations with expired certification. The audit risk rating is recorded as medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Vector Metering has been actively working with the Electricity Authority separately to this audit process on resolving the expired certifications issues. Vector Metering has an established program of work with clear and continual monitoring. Progress continues to be positive and is tracking in accordance with commitments made. Issues such as technician resourcing, access to properties (e.g. customer refusal, vacancy, or another MEP nominated), and safety (VIR, ACM, gas proximity) continue to be present. Solutions for the installations that are unable to be certified are continually being worked on in conjunction with traders, ATHs, and metering vendors.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
See above		

8. INSPECTION OF METERING INSTALLATIONS

8.1. Category 1 Inspections (Clause 45 of Schedule 10.7)

Code reference

Clause 45 of Schedule 10.7

Code related audit information

The MEP must ensure that category 1 metering installations (other than interim certified metering installations):

- *have been inspected by an ATH within 126 months from the date of the metering installation's most recent certification or*
- *for each 12-month period, commencing 1 January and ending 31 December, ensure an ATH has completed inspections of a sample of the category 1 metering installations selected under clause 45(2) of Schedule 10.7.*

Before a sample inspection process can be carried out, the MEP must submit a documented process for selecting the sample to the Electricity Authority, at least 2 months prior to first date on which the inspections are to be carried out, for approval (and promptly provide any other information the Authority may request).

The MEP must not inspect a sample unless the Authority has approved the documented process.

The MEP must, for each inspection conducted under clause 45(1)(b), keep records detailing:

- *any defects identified that have affected the accuracy or integrity of the raw meter data recorded by the metering installation,*
- *any discrepancies identified under clause 44(5)(b)*
- *relevant characteristics, sufficient to enable reporting of correlations or relationships between inaccuracy and characteristics,*
- *the procedure used, and the lists generated, to select the sample under clause 45(2).*

The MEP must, if it believes a metering installation that has been inspected is or could be inaccurate, defective or not fit for purpose:

- *comply with clause 10.43,*
- *arrange for an ATH to recertify the metering installation if the metering is found to be inaccurate under Table 1 of Schedule 10.1, or defective or not fit for purpose.*

The MEP must by 1 April in each year, provide the Authority with a report that states whether the MEP has, for the previous 1 January to 31 December period, arranged for an ATH to inspect each category 1 metering installation for which it is responsible under clause 45(1)(a) or 45(1)(b).

This report must include the matters specified in clauses 45(8)(a) and (b).

If the MEP is advised by the Authority that the tests do not meet the requirements under clause 45(9) of Schedule 10.7, the MEP must select the additional sample under that clause, carry out the required inspections, and report to the Authority, within 40 business days of being advised by the Authority.

Audit observation

NGCM

I checked the process, and the results for the Category 1 inspection regime to confirm compliance.

AMCI

I checked the process, and the results for the Category 1 inspection regime to confirm compliance.

Audit commentary

NGCM

AMA has combined the NGCM and AMCI category 1 metering installations for the purpose of conducting inspections. The inspections were conducted using the method under clause 45(1)(b), sample inspection. AMA has had their process approved by the Authority and I have reviewed the inspection reports and summary report to ensure compliance.

Inspection of a sample of 812 Category 1 ICPs was conducted during 2022. The number requiring inspection was correctly determined by producing a list of all ICP identifiers of each Category 1 metering installation for which NGCM and AMCI are responsible and removing from the list any ICP identifiers for metering installations that had been certified or inspected in the 84 months prior to 31 December 2022. The total ICPs remaining was 581,492 so the minimum sample required by Table 8 of Schedule 10.1 was 800.

The summary report was sent to the Authority on 23 March 2023. The inspection report states that a sample of 812 ICPs were inspected.

Details of the instances of issues found during the inspections are shown in the table below:

Count of ICPs	Description of Non-compliance:
53	Site certificate illegible or missing.
4	Seals missing but no sign of tampering. *Verified and re-sealed.*
93	LCD details to be updated. *LCDs recorded on site have been updated.*
11	LCDs found bridged on site.
1	LCD not recorded on site. *Updated on JDE and Registry.*
19	Tariff to be updated – generally due to controlled load moving to gas.
13	LCD bridged due to local network requirements.
6	ICPs removed from inspections – two meters relocated (to be replaced), two meters replaced, and two meters suspected tamper.
Please note that some ICPs are in more than one category.	

AMCI

AMA has combined the NGCM and AMCI category 1 metering installations for the purpose of conducting inspections, see comments above under NGCM.

Audit outcome

Compliant

8.2. Category 2 to 5 Inspections (Clause 46(1) of Schedule 10.7)

Code reference

Clause 46(1) of Schedule 10.7

Code related audit information

The MEP must ensure that each category 2 or higher metering installation is inspected by an ATH at least once within the applicable period. The applicable period begins from the date of the metering installation's most recent certification and extends to:

- *126 months for Category 2*
- *63 months for Category 3*
- *33 months for Category 4*
- *19 months for Category 5.*

Audit observation

NGCM

I checked the registry information to confirm which metering installations were due for inspection and checked the NGCM records to determine if inspections were conducted.

AMCI

I checked the registry information to confirm which metering installations were due for inspection and checked the AMCI records to determine if inspections were conducted. I checked if there were any NSP metering installations requiring inspection during the audit period.

Audit commentary

NGCM

NGCM does not intend to conduct inspections for Category 2 metering installations because the inspection period is the same as the certification period. There were 383 metering installations that were certified for 15 years under the previous Code due for inspection during the audit period and inspections were not completed. Non-compliance is also recorded in **section 6.4** as certification was not cancelled within ten business days for all 383 metering installations.

AMCI

I checked the registry information and determined that there were 468 metering installations at categories 2, 3, 4 and 5 that were due for inspection during the audit period. 326 of these were either inspected or recertified within the maximum inspection period, or had certification cancelled prior to ten days after the latest inspection due date. There were 142 metering installations where inspections were not completed within the maximum inspection period. I have recorded non-compliance for these 142 metering installations.

My analysis determined that there were 486 metering installations at Categories 2, 3, 4 and 5 that were due for inspection during the audit period. There were 142 inspections not completed within the required timeframes.

Non-compliance is also recorded in **section 6.4** as certification had not been cancelled within ten business days for the 142 ICPs.

AMCI provided the details of 20 NSP metering installations where inspections were due but not completed during the audit period. The inspections were missed due to a reporting issue in Service Max which excluded NSP inspections form the list of metering installations requiring inspection. AMCI advised that they have cancelled the certification of these metering installations and is taking action to recertify. As

NSP metering is not recorded in the registry there is no requirement to update the registry within ten business days under **section 6.4**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 8.2 With: Clause 46(1) of Schedule 10.7 From: 01-Nov-22 To: 29-May-23	**NGCM** 383 metering installations with inspection not conducted. **AMCI** 142 metering installations with inspection not conducted. 20 NSP metering installations with inspections not conducted. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	I have recorded the controls as moderate in this area for NGCM because reporting is in place but there is room for improvement. AMCI's inspection controls are rated as moderate because there is a regime in place to identify and manage inspections but not all inspections were able to be completed. The issues found can potentially have a moderate impact on other participants and on settlement. The audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
All identified instances are in the process of being corrected on the Registry	30/09/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering recognise that there are several issues that contribute to this non-compliance, primarily access and field resources. The impact of COVID is still acutely present (e.g. limiting the pool of international resources). We are now hearing that this is easing but it has created a backlog of work that will likely exist until an appropriate number of technicians can be trained. Considerations must also be made for the future pipeline of work and the sustainable necessity of these roles by avoiding peaks where possible.	Ongoing	

8.3. Inspection Reports (Clause 44(5) of Schedule 10.7)

Code reference

Clause 44(5) of Schedule 10.7

Code related audit information

The MEP must, within 20 business days of receiving an inspection report from an ATH:

- *undertake a comparison of the information received with its own records,*
- *investigate and correct any discrepancies,*
- *update the metering records in the registry.*

Audit observation

NGCM

I checked the process and results from inspection regimes to ensure any incorrect records were updated.

AMCI

I checked the process and results from inspection regimes to ensure any incorrect records were updated.

Audit commentary

NGCM

NGCM has completed inspections for Category 1 metering installations and the process includes a registry comparison and the registry is updated when required.

AMCI

AMCI conducts the checks required by this clause and compares data to that shown in Service Max. The registry is updated when discrepancies are identified.

Audit outcome

Compliant

8.4. Broken or removed seals (Clause 48(1G), (4) and (5) of Schedule 10.7)

Code reference

Clause 48(4) and (5) of Schedule 10.7

Code related audit information

If the MEP is advised of a broken or removed seal it must use reasonable endeavours to determine

a) who removed or broke the seal,
b) the reason for the removal or breakage.

and arrange for an ATH to carry out an inspection of the removal or breakage and determine any work required to remedy the removal or breakage.

The MEP must make the above arrangements within

a) three business days, if the metering installation is category 3 or higher,
b) Ten business days if the metering installation is category 2,
c) 20 business days if the metering installation is category 1.

If the MEP is advised under 48(1B)(c) or (48(1F)(d) the MEP must update the relevant meter register content code for the relevant meter channel.

Audit observation

NGCM

I checked examples of notification of missing seals, which were as a result of inspection processes or notification by field technicians.

AMCI

I asked AMCI if there were any examples of broken or removed seals reported during the audit period.

Audit commentary

NGCM

NGCM has a documented process in place for the management of seals and any subsequent investigation and reporting. There were four examples of seals being found missing during Category 1 inspections. The ATH determined the meters were functioning correctly and the seals were replaced.

AMCI

AMCI has a documented process in place for the management of seals and any subsequent investigation and reporting. There were no examples of broken or removed seals reported during the audit period.

Audit outcome

Compliant

9. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

9.1. Investigation of Faulty Metering Installations (Clause 10.43(4) and (5))

Code reference

Clause 10.43(4) and (5)

Code related audit information

If the MEP is advised or becomes aware that a metering installation may be inaccurate, defective, or not fit for purpose, it must investigate and report on the situation to all affected participants as soon as reasonably practicable after becoming aware of the information, but no later than:

- *a) 20 business days for Category 1,*
- *b) ten business days for Category 2 and*
- *c) five business days for Category 3 or higher.*

Audit observation

NGCM

I checked 15 examples where NGCM had become aware of faulty metering installations, where meters or had been bridged in order to reconnect.

AMCI

I checked four examples where AMCI had become aware of faulty metering installations.

Audit commentary

NGCM

NGCM has a documented process in place to achieve compliance with this requirement.

I checked 15 cases where meters had been bridged during the audit period. In all cases, the appropriate participants were notified at the time of bridging, compliance was achieved with the required timeframes.

AMCI

AMCI provided details of two faulty metering installations.

Details of the notifications provided to affected participants are recorded in the following table:

ICP/NSP	Metering installation category	Date fault found	Date MEP advised	Date notification provided to participants	Business days to notify participants
0000880342WE7D0	3	21 December 2022	10 January 2023	10 January 2023	<1
TGC0011TENCEN	4	7 October 2022	11 October 2022	17 October 2022	4

I have recorded compliance in this section as notification to the affected participants was provided within five business days in both cases.

I have recorded non-compliance in **section 6.4** as AMCI did not cancel the certification of ICP 0000880342WE7D0 within ten business days.

Audit outcome

Compliant

9.2. Testing of Faulty Metering Installations (Clause 10.44)

Code reference

Clause 10.44

Code related audit information

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

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

- *a) test the metering installation,*
- *b) provide the MEP with a statement of situation within five business days of:*
- *c) becoming aware that the metering installation may be inaccurate, defective or not fit for purpose; or*
- *d) reaching an agreement with the participant.*

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

Audit observation

NGCM

I checked 15 examples where NGCM had become aware of faulty metering installations, where meters or had been bridged in order to reconnect.

AMCI

I checked two examples where AMCI had become aware of faulty metering installations.

Audit commentary

NGCM

NGCM has a documented process in place to achieve compliance with this requirement.

I checked 15 examples where meters had been bridged during the audit period. The forms completed in the field by the ATHs contain sufficient information to report to relevant parties and meet the requirement for the provision of a statement of situation.

AMCI

AMCI has a process in place to achieve compliance with this requirement. Two examples were checked, and the ATH performed testing and provided statements of situation in both examples.

Audit outcome

Compliant

9.3. Statement of Situation (Clause 10.46(2))

Code reference

Clause 10.46(2)

Code related audit information

Within three business days of receiving the statement from the ATH, the MEP must provide copies of the statement to:

- *the relevant affected participants*
- *the Authority (for all category 3 and above metering installations and any category 1 and category 2 metering installations) on request.*

Audit observation

NGCM

I checked 15 examples where NGCM had become aware of faulty metering installations, where meters or had been bridged in order to reconnect.

AMCI

I checked two examples where AMCI had become aware of a faulty metering installation.

Audit commentary

NGCM

The forms completed in the field by the ATHs contain sufficient information to report to relevant parties and meet the requirement for the provision of a statement of situation in all 15 examples.

AMCI

AMCI provided details of two faulty metering installations.

Statements of situation were provided by the ATH in both cases, and these were provided to affected participants. The timeframes are recorded in the following table:

ICP/NSP	Metering installation category	Date fault found	Date statement of situation provided by ATH	Date statement of situation provided to participants	Date statement of situation provided to Authority	Business days to notify participants and Authority
0000880342WE7D0	3	21 December 2022	10 January 2023	10 January 2023	10 January 2023	<1
TGC0011TENCEN	4	7 October 2022	11 October 2022	17 October 2022	17 October 2022	4

I have recorded non-compliance in this section as the statement of situation for the faulty metering installation at NSP TGC0011TENCEN was not provided to the Authority and affected participants within three business days.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 9.3 With: Clause 46(2) From: 14-Oct-22 To: 17-Oct-22	**AMCI** Statement of situation for faulty metering installation at NSP TGC0011TENCEN not provided to the Authority and affected participants within three business days. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	I have recorded the controls as strong as the AMCI understands the requirement to provide information to affected participants and the Authority. The impact on settlement and participants is minor as the notification was late by one day; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
No further action required as the statement has been provided.	NA	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will remind team members of these obligations	31/08/2023	

9.4. Timeframe for correct defects and inaccuracies (Clause10.46A)

Code reference

Clause10.46A

Code related audit information

When the metering equipment provider is advised under 10.43 or becomes aware a metering installation it is responsible for is inaccurate, defective or not fit for purpose the metering equipment provider must undertake remedial actions to address the issue.

The metering equipment provider must use its best endeavours to complete the remedial action within ten business days of the date it is required to provide a report to participants under 10.43(4)(c).

Audit observation

NGCM

I checked 15 examples where NGCM had become aware of faulty metering installations where the meters had been bridged.

AMCI

I checked two examples where AMCI had become aware of a faulty metering installation.

Audit commentary

NGCM

The required timeframe for an MEP to complete remedial action is within ten business days of the date it is required to provide a report to participants under 10.43(4)(c). Clause 10.43(5) specifies the time period for providing the report as 20 business days after becoming aware of the event or circumstance for a Category 1 metering installation. Therefore, to achieve compliance with these clauses the remedial work must be completed within 30 business days of NGCM receiving notification of bridging of meters. I have recorded non-compliance as nine of 15 examples of bridged meters checked were not unbridged and recertified within 30 days.

I have also recorded non-compliance in **section 9.5** for all 15 examples as clause 10.33C requires the MEP to reinstate the meter so that all electricity flowing into the ICP flows through a certified metering installation within five business days of receiving the notice.

AMCI

AMCI provided details of two faulty metering installations.

Details of the faults, remedial actions and timeframes involved are included in the following table:

ICP/NSP	Metering installation category	Date fault found	Date remedial action completed	Details of fault and remedial action	Business days to complete remedial action
0000880342WE7D0	3	21 December 2022	1 April 2023	Faulty HV metering unit requiring replacement. The failure resulted in loss of supply to the customer and the metering installation was bypassed to reinstate supply until a replacement metering unit was sourced and installed.	66
TGC0011TENCEN	4	7 October 2022	Not completed	ATH went to site to recertify and found that not all load is metered due to switchboard alterations that have taken place since the last certification. To remedy this situation the property owner needs to undertake remedial work which had not been conducted at the time of the audit.	Not completed

I have recorded compliance despite the remedial action not being completed within ten business days for both cases. AMCI has used its best endeavours to complete the work within ten business days but in these cases the nature of the work required has meant that this was not possible.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 9.4 With: Clause 46A From: 01-Nov-22 To: 29-May-23	**NGCM** Remedial action not completed in required timeframe after notification of a faulty metering installation for nine ICPs. 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 the controls as moderate as there is room for improvement. The impact on settlement and participants is minor based on the number of ICPs affected; therefore, the audit risk rating is low.

Actions taken to resolve the issue	**Completion date**	**Remedial action status**
Vector Metering will continue to work on resolving the outstanding issues on the installations.	31/10/2012	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to review its processes to determine what improvements can be made to meet the Code requirements. It is noted that due to the nature of the activities involved it is not always possible to achieve the defined timeline requirements due to the reliance on other parties.	Ongoing	

9.5. Meter bridging (Clause 10.33C)

Code reference

Clause 10.33C

Code related audit information

An MEP may only electrically connect an ICP in a way that bypasses a meter that is in place ("bridging") if the MEP has been authorised by the responsible trader.

The MEP can then only proceed with bridging the meter if, despite best endeavours:

- *the MEP is unable to remotely electrically connect the ICP,*
- *the MEP cannot repair a fault with the meter due to safety concerns,*
- *the consumer will likely be without electricity for a period which would cause significant disadvantage to the consumer.*

If the MEP bridges a meter, the MEP must notify the responsible trader within one business day and include the date of bridging in its advice.

Audit observation

NGCM

I checked a sample of 15 examples of bridged meters.

AMCI

I checked if there were any examples of bridged meters.

Audit commentary

NGCM

NGCM provided a list of 26 meters that were bridged by the trader in order to reconnect during the audit period. NGCM was notified by the traders on the day of bridging in all 26 cases. I checked a sample of 15 of the 26 meters in detail.

Clause 10.33C requires the MEP to reinstate the meter so that all electricity flowing into the ICP flows through a certified metering installation within five business days of receiving the notice.

I have recorded non-compliance as for all 15 of the ICPs as NGCM did not reinstate the meter so that all electricity flowing into the ICPs flows through a certified metering installation within five business days of receiving the notice.

AMCI

AMCI provided an example of a Category 5 metering installation at ICP 0000880342WE7D0 where the metering installation was bypassed after a fault on the voltage transformer. I have considered this case and determined that Clause 10.33C is not applicable as it is not the meter that is bridged as the metering installation in its entirety has been bypassed. Whilst bridging is not defined in Part 1, I consider that this clause is applicable only to Category 1 whole current meters and not Category 2 and above metering installations with measuring transformers.

AMCI advised that there were no Category 1 meters bridged in the audit period.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 9.5 With: Clause 10.33C From: 01-Nov-22 To: 29-May-23	**NGCM** Meters not reinstated after bridging within five business days of bridging for a sample of 15 of 26 bridged Category 1 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	I have recorded the controls as moderate as there is room for improvement. The impact on settlement and participants is minor based on the number of ICPs affected; therefore, the audit risk rating is low.
Actions taken to resolve the issue	**Completion date** / **Remedial action status**

Vector Metering will continue to work on resolving the outstanding issues on the installations.	31/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering is working with traders to obtain pre-approval for the re-instatement of the metering if the initial request has come from them by treating it as a single job with multiple site visits. As this engagement is with multiple parties and involves commercial arrangements, we unfortunately do expect this to be a prompt process. This is an example of a Code obligation on a participant where it is often dependent on the actions of another party to achieve full compliance. An MEP requires permission from the trader to access a property and, in-turn, a trader must provide their customer with the advanced notification in their customer contracts. This is commonly at least 10 business days prior to access unless it is for safety reasons, which rectifying a bridged meter would not be. This 10-day period is what the EA expects as noted in its Principles and Minimum Terms and Conditions for Domestic Contracts. Vector Metering accepts that this mismatch in timeframes will not always be the primary cause in not meeting the obligation.	31/10/2023	

10. ACCESS TO AND PROVISION OF RAW METER DATA AND METERING INSTALLATIONS

10.1. Access to Raw Meter Data (Clause 1 of Schedule 10.6)

Code reference

Clause 1 of Schedule 10.6

Code related audit information

The MEP must give authorised parties access to raw meter data within ten business days of receiving the authorised party making a request.

The MEP must only give access to raw meter data to a trader or person, if that trader or person has entered into a contract to collect, obtain, and use the raw meter data with the end customer.

The MEP must provide the following when giving a party access to information:

a) the raw meter data; or
b) the means (codes, keys etc.) to enable the party to access the raw meter data.

The MEP must, when providing raw meter data or access to an authorised person use appropriate procedures to ensure that:

- *the raw meter data is received only by that authorised person or a contractor to the person,*
- *the security of the raw meter data and the metering installation is maintained,*
- *access to the raw meter data is limited to only the specific raw meter data under clause 1(7)(c) of Schedule 10.6.*

Audit observation

NGCM

I checked whether any parties had requested access to raw meter data.

AMCI

I checked whether any parties had requested access to raw meter data.

Audit commentary

NGCM

No requests have been received but NGCM advised access could be granted in accordance with this clause if necessary.

AMCI

No requests have been received but AMCI advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.2. Restrictions on Use of Raw Meter Data (Clause 2 of Schedule 10.6)

Code reference

Clause 2 of Schedule 10.6

Code related audit information

The MEP must not give an authorised person access to raw meter data if to do so would breach clause 2(1) of Schedule 10.6.

Audit observation

NGCM

I checked whether any parties had requested access to raw meter data.

AMCI

I checked whether any parties had requested access to raw meter data.

Audit commentary

NGCM

No requests have been received but NGCM advised access could be granted in accordance with this clause if necessary.

AMCI

No requests have been received but AMCI advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.3. Access to Metering Installations (Clause 3(1), (3) and (4) of Schedule 10.6)

Code reference

Clause 3(1), (3) and (4) of Schedule 10.6

Code related audit information

The MEP must within ten business days of receiving a request from one of the following parties, arrange physical access to each component in a metering installation:

- *a relevant reconciliation participant with whom it has an arrangement (other than a trader)*
- *the Authority*
- *an ATH*
- *an auditor*
- *a gaining MEP.*

This access must include all necessary means to enable the party to access the metering components.

When providing access, the MEP must ensure that the security of the metering installation is maintained, and physical access is limited to only the access required for the purposes of the Code, regulations in connection with the party's administration, audit and testing functions.

Audit observation

NGCM

I checked whether any parties had requested access to metering installations.

AMCI

I checked whether any parties had requested access to metering installations.

Audit commentary

NGCM

No requests have been received but NGCM advised access could be granted in accordance with this clause if necessary.

AMCI

No requests have been received but AMCI advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.4. Urgent Access to Metering Installations (Clause 3(5) of Schedule 10.6)

Code reference

Clause 3(5) of Schedule 10.6

Code related audit information

If the party requires urgent physical access to a metering installation, the MEP must use its best endeavours to arrange physical access.

Audit observation

NGCM

I checked whether any parties had requested access to metering installations.

AMCI

I checked whether any parties had requested access to metering installations.

Audit commentary

NGCM

No requests have been received, but NGCM advised access could be granted in accordance with this clause if necessary.

AMCI

No requests have been received, but AMCI advised access could be granted in accordance with this clause if necessary.

Audit outcome

Compliant

10.5. Electronic Interrogation of Metering Installations (Clause 8(2), 8(3), 8(5) and 8(6) of Schedule 10.6)

Code reference

Clause 8(2), 8(3), 8(5) and 8(6) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from an MEP's back office, the MEP must

- *ensure that the interrogation cycle does not exceed the maximum interrogation cycle shown in the registry,*
- *interrogate the metering installation at least once within each maximum interrogation cycle.*

When raw meter data can only be obtained from an MEP's back office, the MEP must ensure that the internal clock is accurate, to within ±5 seconds of:

- *New Zealand standard time; or*
- *New Zealand daylight time.*

When raw meter data can only be obtained from an MEP's back office, the MEP must record in the interrogation and processing system logs, the time, the date, and the extent of any change in the internal clock setting in the metering installation.

The MEP must compare the time on the internal clock of the data storage device with the time on the interrogation and processing system clock, calculate and correct (if required by this provision) any time error, and advise the affected reconciliation participant.

When raw meter data can only be obtained from an MEP's back office, the MEP must, when interrogating a metering installation, download the event log, check the event log for evidence of any events that may affect the integrity or operation of the metering installation, such as malfunctioning or tampering.

The MEP must investigate and remediate any events and advise the reconciliation participant.

The MEP must ensure that all raw meter data that can only be obtained from the MEPs back office, that is downloaded as part of an interrogation, and that is used for submitting information for the purpose of Part 15 is archived:

- *for no less than 48 months after the interrogation date*
- *in a form that cannot be modified without creating an audit trail*
- *in a form that is secure and prevents access by any unauthorised person*
- *in a form that is accessible to authorised personnel.*

Audit observation

NGCM

NGCM conducts AMI data collection as an MEP, because data can only be accessed from their back office.

I conducted a walkthrough of the process, and I requested reporting of the following:

- interrogation not conducted within the maximum interrogation cycle,
- event reports sent to retailers,
- clock synchronisation reports, and
- sum-check failures.

AMCI

AMCI conducts HHR data collection for C&I metering as an agent to reconciliation participants for approximately 100 installations. Where AMCI is the MEP, data collection is conducted as an MEP, as outlined in the executive summary.

Audit commentary

NGCM

NGCM demonstrated reporting of ICPs where interrogation did not occur within the maximum interrogation cycle of 90 days. Filtering of the report confirmed that all ICPs had the "AMI Comm" flag set to "N" in the registry, which means compliance is achieved. The registry field update is automatic and is changed back to "Y" once one full day of data is received. The timeliness of investigation of AMI interrogation failures is discussed in **section 10.12**.

NGCM has met the requirement to securely archive data for at least 48 months. This data was viewed during the audit.

Event logs and clock synchronisation processes are discussed in **sections 10.7** and **10.8.**

AMCI

Interrogation cycle

We checked the "problem collects" spreadsheet for June 29th, 2023, which identified the metering installations at the ICPs below as not being read during the maximum interrogation cycle.

ICP	Last Collected Interval	report date	Days	MIC
0802360270LC894	3 May 2022 0:00	29 June 2023 0:00	422	200
0001437708UN9BA	16 March 2022 13:30	29 June 2023 0:00	469	200
0349383049LC60B	13 August 2022 0:00	29 June 2023 0:00	320	200
0000010625HBA14	13 February 2023 0:00	29 June 2023 0:00	136	30
0001951350TGCC2	15 September 2021 0:00	29 June 2023 0:00	652	200
0336239159LC0C0	1 September 2022 0:00	29 June 2023 0:00	301	200
0287668983LC316	19 April 2023 0:00	29 June 2023 0:00	71	30

These have all been followed up with the relevant trader, and AMCI is awaiting further instructions, however the Code is clear that if the ICPs are "active", and data is not collected then compliance has not been achieved.

Clock synchronisation

AMCI synchronises MV90 against an internet time source at 15-minute intervals, and prior to any interrogation cycle. During interrogation, a comparison occurs between data logger and MV90 clocks.

During each interrogation, the data logger internal clock is compared with the data collection system clock, and any errors less than or equal to 60 seconds are adjusted automatically. When errors greater than 60 seconds are detected, one of three processes are followed:

- if AMCI is the MEP and the meter type is EDMI, then the Wellington team conducts the clock synchronisation using the EDMI proprietary system, called EziView,
- if AMCI is the MEP and it is not an EDMI meter, the technical support team in Christchurch conducts the adjustment, and
- if AMCI is not the MEP, the notification is made to the relevant party, and they conduct the adjustment - these examples are not relevant to the MEP audit.

When time errors less than or equal to 60 seconds are detected, the data is not corrected. The entire adjustment occurs within the half hour that the time is adjusted. Notification of time errors outside those stipulated in Table 1 is made to reconciliation participants if they require this reporting.

We checked reporting for the period October 2022 to July 2023, which identified 44 examples of clock errors outside the thresholds. The relevant clause states that "A **metering equipment provider** must ensure that a **data storage device** in a **metering installation** for which it is responsible for **interrogating** does not exceed the maximum time error set out in Table 1 of subclause (5)", which is more stringent that the clause applied to data collection as an agent to reconciliation participants, and stipulates non-compliance exists even if there is a process to correct clock errors.

It was confirmed during this audit that clock synchronisation occurs during manual data collection.

Non-compliance is recorded in **section 10.7**.

Event logs

The walkthrough of the data collection process confirmed the following information is collected during each automated interrogation of HHR metering:

- the unique identifier (serial no) of the meter or data logger,
- the interrogation time,
- the half-hour metering information for each trading period, and
- events log.

The list of events is more than that required and includes the following:

- power outages,
- tamper,
- input state changes,
- clock adjustments,
- processor reset,
- phase failure,
- negative energy,
- data edited,
- meter error, and
- meter alarms.

The interrogation logs are reviewed and any events requiring attention are acted upon as part of the validation process.

Data security and storage

All data is archived in accordance with these clauses for a period more than 48 months. This was confirmed by viewing raw meter data from 2019.

Password protection is in place to ensure raw meter data cannot be accessed by unauthorised personnel. We observed login processes during the audit and noted password protection was in place for systems used to retrieve and store raw meter data.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 10.5 With: Clause 8(2), 8(3), 8(5) and 8(6) of Schedule 10.6 From: 15-Sep-21 To: 29-Jun-23	**AMCI** Data not collected within the maximum interrogation cycle for seven ICPs. Potential impact: Medium Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong because interrogation occurs daily and when interrogation is not successful the trader is notified. In all cases AMCI is awaiting further information or action from traders. 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
Vector Metering will continue to work with the traders to ensure they are actively working on resolving the issues.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering systems or process are not the cause of this identified non-compliance, and it is fully reliant on other participants.	NA	

10.6. Security of Metering Data (Clause 10.15(2))

Code reference

Clause 10.15(2)

Code related audit information

The MEP must take reasonable security measures to prevent loss or unauthorised access, use, modification or disclosure of the metering data.

Audit observation

NGCM

I checked the security and storage of data by looking at examples of data more than 48 months old.

AMCI

We checked the security and storage of data by looking at examples of data more than 48 months old.

Audit commentary

NGCM

Most of the data is provided to reconciliation participants via SFTP or FTP over private VPN. Some data is supplied by password protected email. Password security is in place to prevent unauthorised access prior to data being sent to participants.

AMCI

All data is archived in accordance with these clauses for a period more than 48 months. This was confirmed by viewing raw meter data from 2019.

Password protection is in place to ensure raw meter data cannot be accessed by unauthorised personnel. We observed login processes during the audit and noted password protection was in place for systems used to retrieve and store raw meter data.

Audit outcome

Compliant

10.7. Time Errors for Metering Installations (Clause 8(4) of Schedule 10.6)

Code reference

Clause 8(4) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEPs back office, the MEP must ensure that the data storage device it interrogates does not exceed the maximum time error set out in Table 1 of clause 8(5) of Schedule 10.6.

Audit observation

NGCM

I conducted a walkthrough of the management of time errors, and I checked the relevant reports.

AMCI

We conducted a walkthrough of the management of time errors, and I checked the relevant reports.

Audit commentary

NGCM

The MEP must record in the interrogation and processing system logs the time, the date, and the extent of any change in the internal clock setting in the metering installation. The interrogation log contains this information.

The MEP must ensure that a data storage device in a metering installation does not exceed the maximum time error set out in Table 1 of clause 8(5) of Schedule 10.6. The MEP must compare the time on the internal clock of the data storage device with the time on the interrogation and processing system clock, calculate and correct (if required by this provision) any time error, and advise the affected reconciliation participant. The relevant part of this table is shown below.

Metering Installation Category	HHR Metering Installations (seconds)	NHH Metering Installations (seconds)
1	±30	±60
2	±10	±60

During interrogation the system time is compared to the data logger time. Category 2 installations have a setting of 3 to 10 seconds and Category 1 installations have a setting of 3 to 30 seconds. Reporting for 28th and 29th June 2023 showed 2,116 examples of clock errors over ten seconds.

Details of all time changes are sent to reconciliation participants which meets the requirements of this clause. I confirmed this by checking the reports sent to 20 participants in relation to the 28th and 29th June 2023 reporting.

This clause is slightly different to the clause in Part 15 for reconciliation participants. This clause requires MEPs to ensure the time is not outside the allowable thresholds, therefore non-compliance exists for those examples where time has drifted outside the allowable threshold.

Daylight saving adjustment is conducted as follows:

The meters collect all 'Half Hourly Consumption Data' in NZST. The MultiDrive and Storm head-ends record and store the 'Half Hourly Consumption Data' as NZST. Files are then produced in Coordinated Universal Time (UTC) from the head-ends to be used downstream.

AMCI

AMCI synchronises MV90 against an internet time source at 15-minute intervals, and prior to any interrogation cycle. During interrogation, a comparison occurs between data logger and MV90 clocks.

During each interrogation, the data logger internal clock is compared with the data collection system clock, and any errors less than or equal to 60 seconds are adjusted automatically. When errors greater than 60 seconds are detected, one of three processes are followed:

- if AMCI is the MEP and the meter type is EDMI, then the Wellington team conducts the clock synchronisation using the EDMI proprietary system, called EziView,
- if AMCI is the MEP and it is not an EDMI meter, the technical support team in Christchurch conducts the adjustment, and
- if AMCI is not the MEP, the notification is made to the relevant party, and they conduct the adjustment - these examples are not relevant to the MEP audit.

When time errors less than or equal to 60 seconds are detected, the data is not corrected. The entire adjustment occurs within the half hour that the time is adjusted. Notification of time errors outside those stipulated in Table 1 is made to reconciliation participants if they require this reporting.

We checked reporting for the period October 2022 to July 2023, which identified 44 examples of clock errors outside the thresholds. The relevant clause states that "A **metering equipment provider** must ensure that a **data storage device** in a **metering installation** for which it is responsible for **interrogating** does not exceed the maximum time error set out in Table 1 of subclause (5)", which is more stringent that the clause applied to data collection as an agent to reconciliation participants, and stipulates non-compliance exists even if there is a process to correct clock errors.

It was confirmed during this audit that clock synchronisation occurs during manual data collection.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 10.7 With: Clause 8(4) of Schedule 10.6 From: 01-Nov-22 To: 29-May-23	**NGCM** 2,116 examples of clock errors outside the allowable thresholds in the most recent reports. **AMCI** 44 clock errors outside the thresholds. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong because interrogation is attempted daily, and clock errors are addressed during all interrogations. 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**
NA	NA	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Vector Metering will continue to assess the results of clock checks to identify any opportunities for process or technical improvements. This will include working with vendors.	Ongoing	

10.8. Event Logs (Clause 8(7) of Schedule 10.6)

Code reference

Clause 8(7) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEP's back office, the MEP must, when interrogating a metering installation:

- *a) ensure an interrogation log is generated,*
- *b) review the event log and:*
  - *i. take appropriate action,*
  - *ii. pass the relevant entries to the reconciliation participant.*
- *c) ensure the log forms part of an audit trail which includes:*
  - *i. the date and*
  - *ii. time of the interrogation*

iii. *operator (where available)*
iv. *unique ID of the data storage device*
v. *any clock errors outside specified limits*
vi. *method of interrogation*
vii. *identifier of the reading device used (if applicable).*

Audit observation

NGCM

I conducted a walkthrough of the event management process, and I checked the most recent reports sent to all relevant retailers.

AMCI

We conducted a walkthrough of the event management process, and I checked the most recent reports sent to all relevant retailers.

Audit commentary

NGCM

NGCM downloads the event log as required by this clause. All critical events are evaluated, and appropriate action is taken. The list of events is as follows:

- loss of power,
- battery low,
- pulse overflow,
- voltage tolerance,
- VT failure (voltage tolerance failure),
- measurement error,
- memory failure,
- ROM error,
- meter hardware error,
- possible meter tamper (those caused by a site visit or meter installation are identified and can be ignored),
- relay stuck,
- reverse rotation,
- tamper,
- phase failure (the voltage tolerance error is filtered by meter category to identify Category 2 phase failure), and
- temperature internal, diagnostic at time of read.

The Code requires NGCM to review the event log either manually or by an automated software function which flags exceptions and to:

(i) take appropriate action where problems are apparent, and

(ii) pass relevant event log entries, which could affect raw meter data, to the reconciliation participant for the metering installation.

Compliance is achieved with the requirement to take appropriate action where problems may affect the operation or accuracy of the metering installation and NGCM passes relevant event log entries to the reconciliation participant in all cases. I confirmed this by checking the event reports sent to 27 participants on 21st June 2023.

AMCI

The walkthrough of the data collection process confirmed the following information is collected during each automated interrogation of HHR metering:

- the unique identifier (serial no) of the meter or data logger,
- the interrogation time,
- the half-hour metering information for each trading period, and
- events log.

The list of events is more than that required and includes the following:

- power outages,
- tamper,
- input state changes,
- clock adjustments,
- processor reset,
- phase failure,
- negative energy,
- data edited,
- meter error, and
- meter alarms.

The interrogation logs are reviewed and any events requiring attention are acted upon as part of the validation process.

Audit outcome

Compliant

10.9. Comparison of HHR Data with Register Data (Clause 8(9) of Schedule 10.6)

Code reference

Clause 8(9) of Schedule 10.6

Code related audit information

When raw meter data can only be obtained from the MEP's back office, the MEP must ensure that each electronic interrogation that retrieves half-hour metering information compares the information against the increment of the metering installations accumulating meter registers for the same period.

Audit observation

NGCM

I conducted a walkthrough of the sum-check process, and I checked the most recent reporting.

AMCI

AMCI does not conduct electronic data collection for AMI metering.

Audit commentary

NGCM

NGCM has a "sum-check" process where the scalar interval metering data is compared to the scalar midnight snapshot. The NGCM process identifies failures which are unable to be resolved within three business days. A report is produced daily which identifies the unresolved failures, the report is sent to the MEP team to update the registry with cancellation of certification. The reporting I examined identified five ICPs that had failed sum-check and were not resolved within three business days, the registry was updated with the cancellation within ten business days for all five ICPs.

Compliance is achieved with this clause because sum-check is conducted.

AMCI

AMCI does not conduct electronic data collection for AMI metering.

Audit outcome

Compliant

10.10. Correction of Raw Meter Data (Clause 10.48(2),(3))

Code reference

Clause 10.48(2),(3)

Code related audit information

If the MEP is notified of a question or request for clarification in accordance with clause 10.48(1), the MEP must, within ten business days:

- *respond in detail to the questions or requests for clarification,*
- *advise the reconciliation participant responsible for providing submission information for the POC of the correction factors to apply and period the factors should apply to.*

Audit observation

NGCM

NGCM has a process in place to achieve compliance with this requirement. No specific examples were available to examine.

AMCI

AMCI has a process in place to achieve compliance with this requirement. No specific examples were available to examine.

Audit commentary

NGCM

NGCM has a process in place to achieve compliance with this requirement. No specific examples were available to examine.

AMCI

AMCI has a process in place to achieve compliance with this requirement. No specific examples were available to examine.

Audit outcome

Compliant

10.11.Raw meter data and compensation factors (Clause 8(10) of Schedule 10.6)

Code reference

Clause 8(10) of Schedule 10.6

Code related audit information

The MEP must not apply the compensation factor recorded in the registry to raw meter data downloaded as part of the interrogation of the metering installation.

Audit observation

NGCM

I checked whether NGCM was applying compensation factors to raw meter data.

AMCI

We checked whether AMCI was applying compensation factors to raw meter data.

Audit commentary

NGCM

NGCM is not applying compensation factors to raw meter data.

AMCI

AMCI applies compensation factors as an agent to reconciliation participants, not as an MEP.

Audit outcome

Compliant

10.12.Investigation of AMI interrogation failures (Clause 8(11), 8(12) and 8(13) of Schedule 10.6)

Code reference

Clause 8(11), 8(12) and 8(13) of Schedule 10.6

Code related audit information

If an interrogation does not download all raw meter data, the MEP must investigate the registry why or update the registry to show the meter is no longer AMI.

If the MEP choses to investigate the reasons for the failure the MEP has no more than 30 days or 25% of the maximum interrogation cycle, from the date of the last successful interrogation (whichever is shorter).

If the MEP does not restore communications within this time or determines they will be unable to meet this timeframe they must update the registry to show the meter is no longer AMI.

Audit observation

NGCM

I checked whether NGCM had reporting in place for installations not interrogated within 30 days or 25% of the maximum interrogation cycle.

AMCI

AMCI does not conduct electronic data collection for AMI installations.

Audit commentary

NGCM

Reporting is in place for ICPs not interrogated. This reporting can be configured for any given time period. NGCM has automated the registry update of the "AMI Comm" flag to "N" at 20 days to ensure compliance with the requirement to update the registry within 22 days (25% of the 90-day maximum interrogation cycle). Reporting confirmed there were no examples of unread ICPs where the "AMI Comm" flag was "Y".

AMCI

AMCI does not conduct electronic data collection for AMI installations.

Audit outcome

Compliant

CONCLUSION

AMA has four MEP codes and two distinct operations. AMCI is the code for the Commercial and Industrial (C&I) operation and NGCM is the code for the mass market operation. The other two codes NGCS and STRM have no ICPs in the registry except 0000545280NRE79 which is an unmetered load ICP, therefore these codes are only mentioned in relevant sections.

This audit identified 21 areas of non-compliance and three recommendations are made. I have repeated a recommendation from the last audit regarding uncertainty calculations used by the Wells Approved Test House, and I recommend that AMA clarify the maximum interrogation cycles and services access interfaces for AMCI meters and ensure that this is recorded accurately in certification reports.

The number of errors found in certification reports from ATHs has decreased significantly since the last audit. AMA has regularly met with the ATHs to work on improving the quality of information recorded in certification reports.

The other main issues from this audit are as follows:

- certification is cancelled due to 383 NGCM and 142 AMCI inspections not being conducted,
- certification expired or cancelled for 25,654 NGCM metering installations,
- certification expired or cancelled for 435 AMCI metering installations,
- late updating of registry information,
- inaccurate registry information,
- some certification tests not completed by ATHs,
- notification of alternative certification not provided to the Authority within ten business days for two metering installations,
- 809 ICPs with time dependent meter registers that were not monitored every 12 months,
- meters not reinstated after bridging within five business days of bridging for five ICPs, and
- data not collected within the maximum interrogation cycle for seven AMCI ICPs.

On 15 June 2023 the Electricity Authority published a memo detailing changes to data collection responsibilities. This memo changes the arrangements originally established in 2013, which stated that all data collection, apart from AMI data collection, was the responsibility of the reconciliation participant. The 2023 memo changes the responsibility for some data collection from the reconciliation participant to the MEP, where the MEP has not provided the capability to collect data to the reconciliation participant. This means that where Advanced Metering Assets Limited (AMCI) is the MEP, data collection is being conducted as an MEP. Therefore, the MEP data collection responsibilities will be recorded in this audit report. This section of the audit was conducted by Steve Woods of Veritek as part of the AMA reconciliation agent audit that was already in-progress at the time the memo was issued. In future the AMCI data collection processes will be included in the MEP audit. The reconciliation participant agent report will include data collection for approximately 100 installations where AMCI is not the MEP and will cover the non-MEP functions such as application of compensation factors, validation, estimation and correction for all installations, including those where AMCI is the MEP. The table below shows the details of the recent memo.

Metering Type	Scenario	Responsibility	Comments
HHR	Where it is possible for other parties to interrogate the metering installation	Reconciliation Participant	Electronic interrogation.

HHR	Where the MEP **WILL NOT** provide the interrogation capability, password, or encryption details to the reconciliation participant.	~~Reconciliation Participant~~ Metering Equipment Provider	~~Although password means not possible for other parties to collect data, it is possible if MEP provides access. Electronic interrogation~~ If the MEP will not provide access, then the MEP must be responsible for interrogation.
HHR	Where the MEP **WILL** provide the interrogation capability, password, or encryption to the reconciliation participant.	Reconciliation Participant	Electronic interrogation.
AMI	Where the MEP **WILL NOT** provide the interrogation capability, password, or encryption details to the	Metering Equipment Provider	Note that where interrogation is via radio mesh or GPRS, the nature of communication and metering management systems means the MEP back-office systems are required to meet code obligations for interrogation.

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 provides some guidance on this matter and recommends an audit frequency of three months. After considering AMA's responses and the remedial actions proposed I recommend an audit frequency of 12 months to allow time for improvements to be made.

PARTICIPANT RESPONSE

Vector Metering would like to thank Provera for their work on this audit.

While Vector Metering acknowledges that there are areas of compliance areas that it will continue to work on, it is pleasing to note that progress has been made in some important areas. The low level of instances of non-compliances in relation to the organisation's transaction volume are an accurate reflection of the level of understanding and positive attitudes toward compliance within the business. Less pleasing is the number of non-compliances identified that are the result of a necessary reliance on other participants, where there is no, or limited, ability to control or influence. We would encourage the Electricity Authority to consider how these consequential instances can be more appropriately captured and attributed.

Vector metering recognises that both resolving the expired certifications and maintaining a certification programme are a key focus of the Electricity Authority. Vector Metering has been actively working on its established program of work with clear and continual monitoring. Progress continues to be positive and is tracking in accordance with commitments made. Issues such as technician resourcing, access to properties (e.g. customer refusal, vacancy, or another MEP nominated), and safety (VIR, ACM, gas proximity) continue to be present. Solutions for the installations that are unable to be certified are continually being worked on in conjunction with traders, ATHs, and metering vendors.

We would ask that this all be considered when determining the approved audit frequency. Vector Metering is always open to discussing any comments made within this report, and looks forward to engaging with the EA on improvements opportunities.