

**ELECTRICITY INDUSTRY PARTICIPATION CODE
METERING EQUIPMENT PROVIDER AUDIT REPORT**

For

ARC INNOVATIONS

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EXECUTIVE SUMMARY

This participant audit was performed at the request of Arc Innovations to encompass the Authority's request for an audit, as required by clause 10.20, of Part 10, of the Electricity Industry Participation Code. The relevant clauses were audited as required by the Guidelines for Metering Equipment Provider v.2.0 issued by the Electricity Authority.

The processes involved in providing the MEP services, in relation to installations and the provision of meter readings to reconciliation participants, have not changed. What has changed is the number of ICPs for which Arc Innovations (ARCS/ARSM) is providing the MEP services to. The number of ICPs is decreasing steadily. Since the last audit it has decreased by 2,216 as of 24 July 2017.

The company does not accept nominations for new connections, they are passed to AMS, which becomes the MEP. Any installations where faulty equipment is identified it is evaluated by the Solution Team to decide if it is passed to AMS (install EDM1 meter) or is replaced by Arc Innovations equipment to retain the integrity of the RF Mesh. ARCS/ARCM provides the MEP services only for installations where their equipment is installed.

Arc Innovations does not install legacy meters any more. If a customer does not wish to have a smart meter installed, AMS installs a non-communicated smart meter, which is read by meter readers.

Arc Innovations enhanced their operation by developing the functionality to re program controllers remotely if a tariff needs to be changed. It has also implemented a new database called the "NO Read Database" which is an excellent tool for validating no reads. It has significantly modernized this process compared to how it was done before.

I would like to commend Arc Innovations for constantly looking for ways to provide the MEP's services more efficiently and effectively.

The audit found a small number of non-compliances with relevant clauses of the Code.

The date of the next audit is determined by the Electricity Authority and it is dependent on the level of compliance during this audit. In general, the controls in place are moderate to strong

The breach rating risk total is 12, which results in the recommended audit frequency of 12 months.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Change to registry records	4.10	3 of Schedule 11.4	Information updated in the registry later than 10BD	Moderate	Low	2	Identified
MEP response to switch notification	6.1	1(1) of Schedule 11.4	1(1) of Schedule 11.4	Strong	Low	1	Cleared
Provision of information to the registry	6.2	7(1) of Schedule 11.4	Information for 65 ICPs is missing; some information for metering installations on Scanpower's network are incorrect	Moderate	Low	2	Identified
Correction errors in registry	0	6 of Schedule 11.4	Currently Arv Innovations does not have a process to comply with this clause, corrections are done as identified	Weak	Low	3	Identified
Certification and maintenance	7.1	10.38(a)	Certification expired for 103 metering installation (100 cat 2 and 3 cat1)	Strong	Medium	2	Identified
Category 2 to 5 inspections	8.2	46(1) of Schedule 10.7	100 metering installations category 2 were not inspected	Strong	Medium	2	Identified
Future Risk Rating						12	
Indicative Audit Frequency						12 months	

RECOMMENDATIONS

Subject	Section	Recommendation	Description
		Nil	

ISSUES

Subject	Section	Recommendation	Description
Time errors	10.7	Review process	Decreased number of metering installations being referred for replacement because of time errors

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.

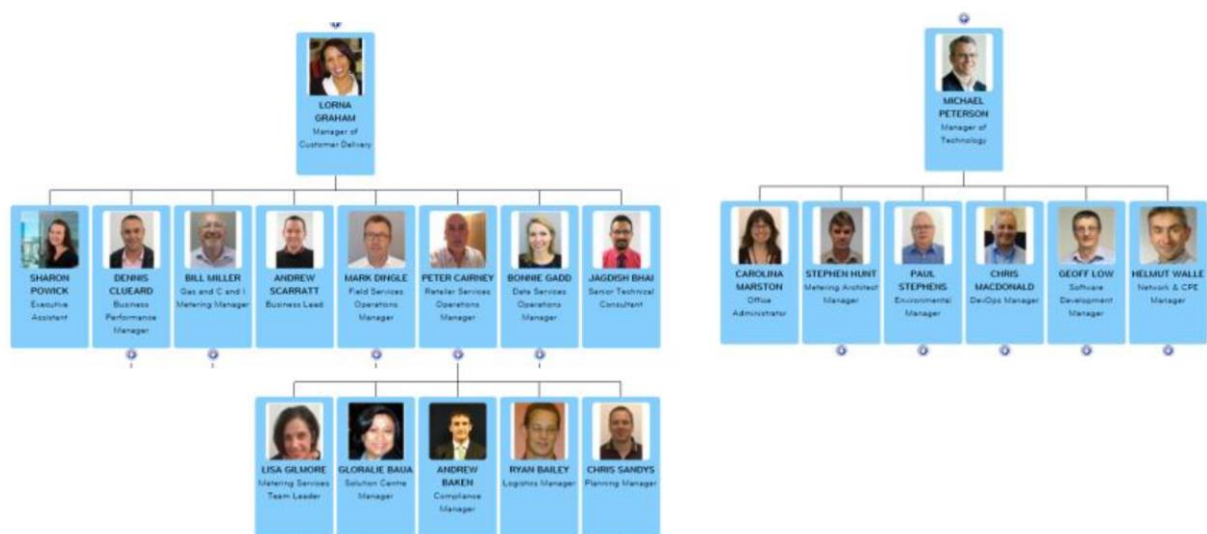
Audit observation

Arc Innovations was granted the exemption #168 on 20th August 2013. The company is exempt from compliance with item 16, of Table 1 of Schedule 11.4, in respect to providing metering component serial number for its first generation advanced metering infrastructure (AMI) metering installations. The reason for granting the exemption was the fact that traders would incur higher administration and compliance costs in changing their internal systems to align existing customer metering records with the new serial numbers in the registry. The exemption will have little or no impact on service providers or other traders supplying ICPs that do not use Arc's first generation AMI metering installations, and will not affect any other Code provisions. The exemption is valid up to 31 December 2018.

Audit commentary

The exemption continues to be valid up to end of next year.

1.2. Structure of Organisation



1.3. Persons involved in this audit

Name	Title	Company	Notes
Andrew Baken	Compliance Manager	Arc Innovations Ltd	Contact person
Nicholas Brown	Technical Analyst	Arc Innovations Ltd	
Meredith Hart.	Reads Technology Analyst	Arc Innovations Ltd	
Gloralie Baua	Service Solutions Centre Manager	Arc Innovations Ltd	
Kevin Burgess	Senior Service Solutions Analyst - Services	Arc Innovations Ltd	
Viky Nitke	Reads Technology Analyst	Arc Innovations Ltd	
Ewa Glowacka	Electricity Authority Approved Auditor	TEG & Associates Ltd	

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 contractors 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

Arc Innovations does not use agents for the functions covered by this audit. All functions are conducted by Arc Innovations's employees.

Audit commentary

Arc Innovations does not use agents for any functions covered by this audit

1.5. Hardware and Software

Software

- Jade Proprietary Arc Innovations back office software AMI 2.0
- Job Management server (to which the PDA's communicate) is Quicknet. Microsoft Windows Mobile v4.21 and .NET Compact Framework v1.0.3316.0 (PDA platform which runs Arc Innovations Field Management System and eSmart installer software, both written using Microsoft Visual Studio). MobiControl - device agents and server platform for remote management of HHP Dolphin PDA's.
- Vanilla job manager is the tool used to record jobs completed on vanilla sites and also stores vanilla asset details.

Hardware

- IBM server
- Meters are METEC, GE and Enermet, and Iskra brands.
- E-Smart controllers are from Dynamic Controls.
- HandHeld readers are Dolphin 9500 series PDA

1.6. Breaches or Breach Allegations

Arc Innovations confirmed that there were no breaches or breach allegations logged since the last audit.

1.7. ICP Data

Arc Innovations provided a list of all ICP's for ARCS as of the 24th July 2017. The total number of ICPs in the registry was 117,742 (active and inactive excluding marked for decommissioning)

Metering Category	Number of ICPs (24/7/17)	Number of ICPs (2016)	Number of ICPs (2015)
1	115,490	116,669	119,814
2	2,198	2,463	2,563
3	0	0	0
4	0	0	0
5	0	0	0
9	19	19	61

Arc Innovations provided a list of all ICP's for ARCM as of the 24th July 2017. The total number of ICPs in registry was 4,169 (active and inactive excluding marked for decommissioning)

Metering Category	Number of ICPs (24/07/17)	Number of ICPs (2016)	Number of ICPs (2015)
1	4,125	5,162	6,571
2	34	77	251
3	0	0	0
4	0	0	0
5	0	0	0
9	2	1	4

1.8. Authorisation Received

Arc Innovations provided a letter of authorisation to TEG & Associates permitting the collection of data from other parties for matters directly related to the audit.

1.9. Scope of Audit

This participant audit was performed at the request of Arc Innovations to encompass the Authority's request for an audit as required by clause 10.20, of Part 10, of the Electricity Industry Participation Code.

The audit was carried out on the Arc Innovations premises at 15 Print Place, in Christchurch, on the 9/11th August 2017.

The audit covered the following functions:

- Process for changing an MEP
- Installation and modification of metering installations
- Metering records
- Maintenance of registry information
- Certification of metering installations
- Inspection of metering installations
- Process of handling faulty metering installations
- Access to and provision of raw meter data and metering installations

1.10. Summary of previous audit

Subject	Clause	Non compliance	Cleared
Gaining metering equipment provider to advise registry	2 of Schedule 11.4	For 5 ICPs metering information updated in the registry later than 15 business days after accepting the MEP nomination	Cleared
MEP to advise registry of changes to registry metering records	3 of Schedule 11.4	Metering records updated in the registry later than 10 business days	Still existing
Metering records in the registry Requirements to provide complete and accurate information	7 of Schedule 11.4 11.2 of Part 11	Some information provided to the registry is not correct.	Still existing
Installations certification	10.37(a) of Part 10	Certification for 8 installations expired	Still existing
Interim certified	18 of Schedule 10.7	4,055 interim certified installations are not certified	Resolved, they are not classified as interim anymore

Subject	Clause	Issue	Cleared
Gaining MEP to advise registry of registry metering records	2 of schedule 11.4	Information updated in the registry later than 15 business days because of late MEP nomination	No MEP nominations
Acceptance of MEP nomination	1(1) of Schedule 11.4	MEP nomination backdated by traders	No MEP nominations

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

Arc Innovations is the MEP for two types of meters, smart meters and legacy meters.

Audit commentary

Smart meters are read remotely from Arc Innovation's back-office via RF Mesh, satellite network or mobile. Satellite and mobile networks are maintained by other parties. Arc Innovations takes full responsibility in maintaining the service of the RF Mesh access interface.

Legacy meters are read by meter readers and recording register reads on handheld devices.

Audit outcome

Compliant

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

Arc Innovation has a procedure in place for resolving any possible disputes.

Audit commentary

In the first instance the matter is dealt with by the Service Solution Centre. Once an issue is identified it is passed to a team which will address the issue and resolve it to both parties satisfaction.

Utilities Disputes Limited is another avenue, which can be used to resolve customers' complaints

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

The LIS file dated 24/7/17 was provided by Arc Innovations to assist in the assessment of compliance.

Audit commentary

According to the LIS files Arc Innovations uses two MEP identifiers, ARCS for smart meters and ARCM for legacy meters.

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

Arc Innovations uses RF Mesh, GSM, and satellite to communicate with their equipment.

Audit commentary

There are no issues with compatibility. Arc Innovations communicate successfully with their meters. Arc Innovations takes full responsibility for this. The company now faces a new issue due to their meters slowly being replaced by AMS. It has to be managed very carefully to retain successful reads using RF Mesh.

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

Arc Innovations pays a lot of attention to make sure that reads provided to participants are complete and accurate. There is a thorough process of data validation before it is sent to reconciliation participants. If the data does not pass the validation parameters, it is put on hold until the issue is resolved.

The process used to find and correct information was examined. The LIS files were examined

Audit commentary

Arc Innovation takes many steps to ensure the accuracy and completeness of information provided to participants and the registry. As soon Arc Innovation is aware that information is incorrect, it is corrected.

Audit outcome

Compliant

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 notification requirements are met (in relation to the registry and the reconciliation manager).

The gaining MEP must pay the losing MEP a proportion of the costs within 20 business days of assuming responsibility.

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.

Audit observation

Arc Innovations has two separate processes for accepting the MEP nomination for smart meters (ARCS) and legacy meters (ARCM). The acceptance for ARCS is fully automated. There are hardly any nominations for ARCM, each nomination is evaluated separately.

Arc Innovation stated they did not receive any request from the losing MEP for a proportion of costs attributable to the certification and calibration test of the metering installation or its components.

Audit commentary

Arc Innovations has a full understanding of their obligation that until another MEP accepts responsibility for an installation, they must meet their obligations.

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

We analysed the Event Listing File (EDA) for the period 15/8/16 to 15/7/17, for both ARCM and ARCS, to assess compliance.

Audit commentary

ARCM had only one MEP nomination for existing installations. It was ICP 0003208700CABCE. We checked that metering data was uploaded the same day as the nomination accepted.

The system automatically accepts MEP nominations for ARCS even if it is incorrect nomination. Every Monday a report is run to check if a meter was installed but no MEP nomination received, had an incorrect date or was rejected. This function is performed as a safe guard.

We identified 17 MEP nominations for ARCS, which were accepted (automatically) and later, for 10 of them, a trader re-nominated NGCM as the MEP because it was rejected by ARCS. It means that 7 MEP nominations were accepted by ARCS and metering data uploaded to the registry. All 7 ICPs are listed below. In all cases the registry was advised of metering records within 15BD.

ICP	Trader (Effective Date)	Trader (Input Date)	MN accepted	Metering upload	Trader
0005599873RNB88	9/11/16	9/11/16	10/11/16	10/11/16	PSNZ
0007111372RN22B	10/10/16	10/10/16	11/10/16	13/10/16	PSNZ
0007115751RN93F	26/08/16	31/08/16	1/09/16	1/09/16	CTCT
0007136919RN4A8	17/10/16	25/10/16	25/10/16	26/10/16	CTCT
0007173992RN383	24/08/16	6/09/16	7/09/16	7/09/16	PSNZ
1520009000CH53D	6/03/17	9/03/17	10/03/17	10/03/17	MERI

Audit outcome

Compliant

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 10 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

During the audit, we discussed with Arc Innovations compliance with this clause.

Audit commentary

The company stated that since the last audit they have not been asked by any gaining MEP to provide access to metering records. If such a request is received, Arc Innovations will follow the Code requirements.

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

Arc Innovations keeps all records of all installations on which they performed any work since the company was established, indefinitely, no records have been destroyed.

Audit commentary

Arc Innovations plans to keep all records 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, 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

Arc Innovations has an “Installations and Maintenance Design Drawings Manual” containing metering installation diagrams. The manual was approved by Delta Utilities Test House. Each design has a drawings number which is quoted on the EIPC Certificate/Electrical Safety Certificate.

The process implemented by Arc Innovations is that if an installation requires any modification to the standard design, a new drawing is created and approved by an ATH.

Audit commentary

10 EIPC Certificates/Electrical Safety Certificates were sighted and we confirm that the reference drawing number was noted on each of them. EIPC Certificates/Electrical Safety Certificates for metering installations category 1 were re-designed since the last audit and they contain more detailed 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

Arc Innovations uses Wells and VircomEMS as the ATHs. Previously the company used Delta Utilities ATH but it was changed early this year. Vircom EMS is mainly used in the Scanpower network.

Audit commentary

Both Test Houses certification is appropriate for the work which is required to be undertaken as per the Electricity Authority's website information.

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

Arc Innovations works in conjunction with the WELLS ATH. All installations for which ARCM/ARCS provide the MEP functionality are category 1 and 2. All installations are wired in accordance with the wiring diagrams approved by Delta Utilities ATH.

Audit commentary

Arc Innovations uses the selective component metering method to certify metering installations of category 1 and 2. The accuracy tolerance of category 1 installations is determined by a meter, the only metering component installed. It means that if the installed meter is class 2, an installation will meet the accuracy tolerance as specified in Table 1 of Schedule 10.1. Metering installation category 2 requires a meter class 2 and CTS class 1.

Arc Innovations installs meters' class 1 and CTs class 0.5. Category 2 installation under this method requires meters to be class 2 and CTs class 1.

The requirements of Table 1 of Schedule 10.1 are met.

Audit outcome

Compliant

4.4. Subtractive Metering (Clause 4(2)(a) of Schedule 10.7)

Code reference

Clause 4(2)(a) of Schedule 10.7

Code related audit information

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

There are no installations managed by ARCM/ARCS which use subtraction to determine volume information for ICPs.

Audit commentary

Arc Innovations is responsible only for metering installation category 1 and 2. No subtraction is used.

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

Arc Innovations does not have any installations category 3 or higher.

Audit commentary

Audit outcome

Not applicable

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

Audit commentary

Audit outcome

Click here to choose outcome from the drop down list.

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

Arc Innovation does not provide the MEP services for point of connection to the grid.

Audit commentary

Audit outcome

Not applicable

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

The standard designs for installation metering category 1 and 2 are used, which were designed in conjunction with the Delta ATH. The process is that any installations which could have unusual physical and/or electrical characteristics are discussed with Wells ATH.

Audit commentary

Arc Innovations is not installing meters for new connections, it is done by AMS. All installations for which any works are done are already known well by Arc Innovations technicians. Most of the work done by ARC is mainly the re-certification of existing installations or replacing faulty equipment for installations for which AMS meters can't be installed.

Audit outcome

Compliant

4.9. Installation & Modification of Metering Installations (Clauses 10.34(2), (2A) 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 installation's:

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

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

Audit observation

Arc Innovations works closely with network companies where their meters are installed, to ensure their requirements are met.

ARC Innovations uses the same tool, called the Design Report Tool, which was described in the previous audit. It allows them to correctly translate traders' tariffs so that controllers can be programmed correctly. The core part of this program are the Rate Products which translate network tariffs into the correct setup for a controller. Report Products were created in conjunction with respective networks to make sure that their requirements were met. Controllers installed outside of Orion network are pre-programmed in-house and sent to a contractor. Controllers installed within Orion network are programmed by technicians using PDAs.

Audit commentary

The Design Reporting Tools are the main tools used by the company. We discussed with the team its application. A new functionality, recently implemented, is the ability to remotely reprogram controllers. The overall amount of work in this area is decreasing because all new installations are done by AMS and only some installations, which are faulty or need to be re-certified, stay with ARCS/ARCM.

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

The MEP must advise the registry of the registry metering records or any change to the registry metering records for a metering installation for which it is responsible, no later than 10 business days following:

- a) the electrical connection of an ICP that is not also an NSP*
- b) any subsequent change in any matter covered by the metering records.*

Audit observation

We analysed the Event Listing File (EDA) for the period 15/8/16 to 15/7/17 for both ARCM and ARCS to assess compliance.

Audit commentary

ARCM

268 metering files were sent to the registry in the period covered by this audit. 205 updates (76.5%) were uploaded to the registry later than 10 BDs, which constitutes non-compliance. Some of these updates are follow ups from the previous audit or correcting information in conjunction with traders.

96 entries were the removal of meters. Some of these updates go back to 2005. It appears that the date of the last entry has been used. The same issue was identified in the last audit.

ARCS

The number of metering files sent to the registry for the time covered by this audit was 3,857. Analysis of the EDA file lead to the identification of around 66 uploads (1.7%) to the registry, which were outside of 10 BDs. It appears most of late updates relate to a correction of information

Arc Innovations commented that in correcting the records, they are technically in breach either way – under 11.4 (3) or 11.2 of part 11. They would really prefer to have a way to achieve the accurate outcome without incurring breaches.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 4.10 With: 3 of Schedule 11.4 From: 15-Jun-17 To: 15-Jul-17	Information updated in the registry later than 10BD Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The impact on settlement is potentially minor, therefore audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Most of the late updates are due to the correction of old records, when an error is found, it is backdated to when the metering was installed or Part 10 go-live in August 2013.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
As more Arc meters are replaced going forward, the accuracy of the meter data on the Registry, and hence, level of compliance is improving all the time. We will continue to correct information on the Registry when required as this is relied on by other parties and needs to be accurate.		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

Arc Innovations had G1 meters and a controller and G2 meters, in which a meter and a controller are integrated. The company has vast experience of each component of an installation and how to integrate them.

Audit commentary

Each installation is tested by a technician and the results are recorded on the EIPC Certificate/Electrical Safety Certificate. If the installation does not pass the tests, any faulty components are replaced. The company comments that there were no complaints from customers or traders noted.

Audit outcome

Compliant

4.12. Responsibility for Metering for ICP to be decommissioned (Clause 11.18B(3))

Code reference

Clause 11.18B(3)

Code related audit information

If an ICP is to be decommissioned, the MEP who is responsible for each metering installation for the ICP must:

- *advise the trader no later than 3 business days prior to decommissioning that the trader must, as part of the decommissioning, carry out a final interrogation; or*
- *if the MEP is responsible for the interrogation of the metering installation, arrange for a final interrogation to take place.*

Audit observation

Arc Innovations takes responsibility for the final reads for ICPs to be decommissioned. The process consists of the following steps:

- (a) request from a trader to remove metering equipment from an installation being decommissioned for example; a building being removed.
- (b) job is created
- (c) contractor goes on site, final read recorded, equipment removed
- (d) registry notified

Audit commentary

Arc Innovations provided 20 examples of decommissioned metering installations to help assess compliance.

ICP	Removal date	Registry updated	Meter serial number	Final read taken
0005767725RN884	7/02/17	8/02/17	60B07H014901	yes
0006448119RNDB6	19/01/17	20/01/17	70C07A012740	yes
0007115803RNEBD	22/02/17	22/02/17	60B08C011378	yes
0005126371RN6D5	27/02/17	1/03/17	60B08C012343	yes
0005534941RN939	20/03/17	24/03/17	60B07C010278	yes
0005349974RN270	11/01/17	16/01/07	6AF08K140808	yes
0000029792EA3CC	10/01/17	12/01/17	70C08G012612	yes
0005045444RN7B4	27/01/17	31/01/17	60B08D011381	yes
0006154247RNB94	17/01/17	18/01/17	6AF08L013821	yes
0000013167EA7FE	20/01/17	20/01/17	60B08B014185	yes
0006493319RN400	17/01/17	23/01/17	70C07A012437	yes
0006486908RN723	23/01/17	21/01/17	60B06B011483	yes
0007146507RNB2B	21/02/17	2/03/17	6AF08L013479	yes
0005362504RND0C	24/03/17	28/03/17	60B08D150068	yes
0005398134RND29	19/04/17	24/04/17	60B07J010630	yes
0006569196RNB23	18/05/17	19/05/17	70A09D010202	yes
0005154731RN188	4/05/17	15/05/17	6AF08K070524	yes
0005249953RN683	13/06/17	14/06/17	60B08D153316	yes
0006962297RN94B	16/12/16	16/12/16	79K13K210109	yes
0005409063RN280	20/01/17	24/01/17	72B07A010147	yes

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

A measuring transformer (CTs) is used only for metering purposes. ARCS/ARCM is the MEP for metering installations of category 2. For such installations ARCS uses CTs class 0.5. In a case where there is a need to replace CTs, they are replaced and the installation is re-certified.

Audit commentary

Compliance was confirmed based on ATH wiring diagrams. Arc Innovations stated that it is not the company's policy to add or change a burden or compensation factor of a measuring transformer. If such a situation was to arise a new set of certified CTS will be installed.

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

The company policy has not changed since the last audit. No changes or upgrades are made to the software, ROM or firmware of a data storage software device (controller) when they are part of a metering installation. The only change to a controller's software applies to communication protocol, which does not have any influence on accuracy of measurement.

Audit commentary

Compliance is confirmed based on the company's policy which is well accepted within the electricity industry.

Audit outcome

Compliant

4.15. Temporary Energization (Clause 10.28(6))

Code reference

Clause 10.28(6)

Code related audit information

An MEP must not request the temporary energisation of a new POC unless authorised to do so by the reconciliation participant responsible for that POC and has an arrangement with that reconciliation participant to provide metering services.

Audit observation

It was discussed with Arc Innovations during this audit.

Audit commentary

The company states that they did not request the temporary energisation of a new ICP because Arc Innovations does not provide MEP services for new connections. For all new connections traders nominate NGCM as the MEP.

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

In bold letters we specify where the records are kept.

- The certification expiry date of each metering component in the metering installation – **PSP dbase**
- All equipment used in relation to the metering installation, including serial numbers and details of the equipment's manufacturer - **PSP dbase and AReg (asset database) and relevant database of its owners**
- The manufacturer's or (if different) most recent test certificate for each metering component in the metering installation - **ATH dbase**
- The metering installation category and any metering installations certified at a lower category – **no such installations**
- All certification reports and calibration reports showing dates tested, tests carried out, and test results for all metering components in the metering installation – **ATH dbase, Share Point (document management system) and relevant database of its owners, PSP database**
- The contractor who installed each metering component in the metering installation - **PSP dbase**
- The certification sticker, or equivalent details, for each metering component that is certified under Schedule 10.8 in the metering installation - **PSP dbase**
- Any variations or use of the 'alternate certification' process - **no such process used**
- Seal identification information - **PSP dbase, each technician uses unique number**
- Any applicable compensation factors - **PSP dbase**

- The owner of each metering component within the metering installation - **PSP dbase**
- Any applications installed within each metering component – **no special applications**
- The signed inspection report confirming that the metering installation complies with the requirements of Part 10 - **PSP dbase**

Audit commentary

The records which are held in both PSP and AReg are synchronised immediately upon any changes made to keep it in sync. During the audit we sampled 11 EIPC Certificates/Electrical Safety Certificates for metering installations of category 1, and 10 for category 2. On our request Arc Innovations presented calibration and certification tests. Revenue meter certificates of calibration were issued by Delta Utility Services (new and refurbished meters) and CT (metering current transformer) certificates issued by TWS.

EIPC Certificate/Electrical Safety Certificate format has improved greatly since the last audit. It contains a lot of information, which was previously stored in the PSP dbase or other places.

As was noted in the previous audit, Arc Innovations avoids mixed asset ownership on installations for which the MEP service is provided. Arc Innovations keeps records of all their assets in AReg or the PSP dbase or have access to the records held by the current owners.

Analysis of the PR-255 showed that 6 ICPs have CTs owned by WATA (3), DELT (1), MERI (1), and LINE (1). They will slowly disappear as Arc Innovation sites are re-certified and its CTs installed or the ICP will transfer to AMS.

Audit outcome

Compliant

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 10 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

Arc Innovations does carry out regular annual inspections for metering installations category 1. The statistical sampling method is used. The results of inspections are sent to the Authority as per the Code requirements.

No inspections are conducted for installations of category 2, these installations are re-certified. If any trader requests an inspection report it would be provided to them. Since the last audit no trader has made such a request.

Audit commentary

Since the last audit no trader has requested a signed inspection report. They are readily available.

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

Arc Innovations keeps all metering installations records since the company was established. No records are deleted.

Audit commentary

Arc Innovations keeps all historic recorded since the company was established, which was more than 48 months ago, therefore compliance with the above clause is met.

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 10 business days after the contract comes into effect.

Audit observation

Arc Innovation used in the part Delta Utilities Services ATH and VircomEMS (mainly for legacy meters). At the beginning of this year Arc Innovations signed an agreement with Wells ATH.

Audit commentary

All metering records related to metering installations for installations which need to be recertified under Wells ATH “umbrella” are available if needed.

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 10 business days of being advised by the registry 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 it accepts responsibility for the ICP and of the proposed date on which it will assume responsibility.

Audit observation

We analysed the Event Listing File (EDA) for the period 15/8/16 to 15/7/17 for both ARCM and ARCS to assess compliance.

Audit commentary

ARCM received only one MEP nomination for ICP 0003208700CABCE. It was received on 12/07/16 and accepted on 24/8/16, which is later than 10 BD. It is identified as non-compliance. It was cleared because it was a one-off and there is a strong process in place to handle the MEP nominations, which basically won't be accepted anymore.

ARCS received the MEP nomination for 6 ICPs listed in section 0. All of them were confirmed to be within 10 BD.

The company policy is not to accept the MEP nomination. The cases listed above were nearly 9 months ago when the policy was not firmly in place yet.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.1 With: 1(1) of Schedule 11.4 From: 12-Jul-16 To: 24-Aug-16	MEP acceptance for ICP 0003208700CABCE was sent to the registry after 32 BD Potential impact: None Actual impact: None Audit history: Once previously Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The impact on settlement is potentially minor, therefore audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
ARCM received only one MEP nomination. This was a one-off and there is a strong process in place to handle the MEP nominations.			Cleared
Preventative actions taken to ensure no further issues will occur		Completion date	
ARCM (Legacy) nominations won't be accepted anymore.		Completed	

6.2. Provision of Registry Information (Clause 7 (1), (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, in the prescribed form for each metering installation for which the MEP is responsible.

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 must derive from the metering equipment provider's records or the metering records contained within the current traders system.

Audit observation

To assess compliance with this clause we used the Registry Data Analysis database provided by the Authority. Arc Innovations provided the LIS file and PR-255. We identified a few irregularities as to how the registry is populated, most of them were identified in the previous audits. The number of irregularities is decreasing steadily because Arc Innovations meters are being replaced by AMS.

Audit commentary

The results from the Registry Data Analysis database are shown below

Cat 2 with multiplier over 100	1 ICP compensation factor of 200; it is correct
Cat 3 and above without HHR profile or HHR meter or HHR installation	no ICPs
Cat 1 over 15 years Cat 2 over 10 years or over 15 if cert before 29/8/2013 Cat 3 over 10 years Cat 4 over 5 years Cat 5 over 3 years	no ICPs
Invalid certification date	no ICPs
Cert Expiry date > Today	100 ICPs cat 2; 3 ICPs cat 1
Compensation factor on Cat 1 Installation	no ICPs
CT on Cat 1 Check component type of "C" on Cat 1	10 ICPs - CT metering without EIPC details previously highlighted. Inherited from MERI and installed pre March 2010 (exact date unknown). To be replaced in due course
Export ICPs (load type of generation or both) Check that the registry has an "I" channel	No ICPs.
HHR profile and submission type and meter or installation type is not HHR	no ICPs
Any Interim Certified Installation	2,544 ICPs (ARCM)

Looks for invalid cert, cert expiry and variation expiry dates	no ICPs
Meter data missing	65 ICPs
Any compensation factor that is not: 20,30,40,50,60,80,100,120,160,200,240,400	240 ICPs has multiplier 3. 1PH meter on 3 PH installation. Correct entry. These installations will be upgraded in AMS deployment
Over Cat 1 with No CTs	No ICPs
Control device not populated All CN, NC, D, N should have control device unless they are AMI	1,741 ICPs on Scanpower network, no data received from Meridian
Profile analysis Check period of availability and register content: CN without any other tariff	No ICPs
Profile analysis Check period of availability and register content: Day and night = 24	No ICPs
Profile analysis Check period of availability and register content: Day without Night	No ICPs
Profile analysis Check period of availability and register content: IN Register cannot be 24 or 0	No ICPs
Control device not populated - All "IN" register content should have control device	28 ICPs, correct, internal ripple receiver within a controller
Profile analysis Check period of availability and register content: Night without Day	37 ICPs. 3 reg weekender N10 WDD14 WED14. 23 ICPs corrected
Profile analysis Check period of availability and register content: UN Register not 24	No ICPs
Check for profile that requires a control device but CDC flag = N E11, E21, E24, E08, E13, C23, C24, TON, TOC, DCS, T07, T08, T23, T24	No ICPs

Non-compliance is identified because there is information missing for 65 ICPs, it is 50% less than 12 months ago.

In the last audit it was noted that some information for ARCM installations in the Scanpower area was incorrect due to the fact that this information was taken from the Meridian billing system, who altered some of them to suit their billing system. The number of installations for which ARCM is the MEP has

decreased again since the last audit as a result of the smart meters installation. The number will decrease significantly over the next couple of years as the installations are upgraded to NGCM smart meters.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.2 With: 7(1) of Schedule 11.4 From: 15-Aug-16 To: 15-Jul-17	Information for 65 ICPs is missing; some information for metering installations on Scanpower's network is incorrect Potential impact: Low Actual impact: Low Audit history: Twice before Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The impact on settlement is potentially minor, therefore audit risk rating is low. Meters on Scanpower's network will be replaced as part of an upgrade to smart meters		
Actions taken to resolve the issue		Completion date	Remedial action status
53 ICPs are ARCM, down from 139 last audit. 12 are ARCS, down from 32 last audit. The 53 ARCM are all due for smart replacement and the number is reducing as they are replaced. The 11 ARCS are set to Category 9 and are either decommissioned or in the process of being decommissioned. One ICP is Cat 2 and has been populated.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
These are predominantly legacy meters (Arc is no longer installing Legacy meters), plus Arc smart which are mostly replaced with EDM1 meters under the NGCM MEP.		Ongoing	

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 5 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 5 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

It was discussed with Arc Innovations. The company used to have a Reconciliation Analyst, whose responsibility was to solve and correct discrepancies between Arc Innovation's records (PSP database) and the registry. The position was disestablished. Any incorrect information in the registry if identified is corrected on an ad-hoc basis. Some corrections in the registry are triggered by traders who want to clean-up their records

Audit commentary

In the past, a Reconciliation Analyst used to do a comparison every week. A lot of discrepancies were cleaned up. The current business model of Arc Innovations results in a very small number of meters being changed therefore there is no need to change the registry records. The company is still committed to having correct information in the registry but it is not a structured process. Non-compliance identified

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.3 With: 6 of Schedule 11.4 From: 15-Aug-16 To: 15-Jul-17	Currently Arv Innovations does not have a process to comply with this clause, corrections are done as identified Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The impact on settlement is potentially small, therefore audit risk rating is low. In the past Arc Innovations put a lot of work into the clean-up of records in the registry		
Actions taken to resolve the issue		Completion date	Remedial action status
Arc only install a very small number of meters and we have cleaned up the data as much as we practically can. Of the 65 meters identified in this audit, the majority are legacy meters on a particular network, and a site visit is required to gather the missing data. When we do visit the site next it will be to upgrade the ICPs to EDMl smart meters.			Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
The number of meters identified has more than halved since the last audit and it will continue to reduce until all the meters have been upgraded. VAMS had a dedicated resource for this and we cleaned up most of the data on the Registry, we are no longer seeing new discrepancies between Arc systems and the Registry. With these circumstances in mind, we believed there was little value running this process when there is such a small number (which we can account for) and that number is diminishing.			

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) or 19(6)*
- 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 the maximum current conveyed through the metering installation at any time exceeds the current rating of its metering installation category as set out in Table 1 of Schedule 10.1*
- 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 10 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.*

A metering equipment provider must, within 10 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.

Audit observation

The reasons for the certification cancellation described in this clause can be put into two groups. The first group of reasons consists of situations where Arc Innovations has no influence at all. They are listed in subsection c) and d). In such circumstances, the company can only rely on advice given by responsible parties and act accordingly.

The second group are events covered in a), b), e), f), g), h).and i), which if take a place, will cause the cancellation of installation certification. Each of these events were discussed in relevant parts of this report.

- (a) Installation modification – this was discussed and covered in section
- (b) Accuracy tolerance – this is covered in section
- (e) Lack of inspection – this is covered in detail in section
- (f) Certification to lower category – Arc Innovation does not have such ICP
- (g) Insufficient load for full certification – this was discussed in section 7.7. A technician always carries an electrical load with him
- (h) Bridged out load control device – the process was described in section 7.11. Arc Innovations does not carry out work after hours

- (i) Seal broken – the process was discussed in section

Audit commentary

The evets listed in subsection a), b), e), f), g), h).and i) were reviewed during this audit. We found processes compliant.

Audit outcome

Compliant

6.5. Registry Metering Records (Clause 11.8A)

Code reference

Clause 11.8A

Code related audit information

The MEP must provide the registry 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

Arc Innovations provided the required metering information to the registry to their best knowledge. The information was provided in the prescribed form and the registry records were uploaded as per Schedule 11.4

Audit commentary

We checked the LIS file and checked the process of updating information in the registry. It is done by the system or done manually via website. More details about information in the registry are in relevant sections.

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 certification 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

Arc Innovations works under the Wells Test House certification to maintain the certification of metering installations for which it is responsible as the MEP. After each certification of an installation is finalised, metering records are updated on the installers' PDA and transferred to the PSP database, which updates the registry overnight.

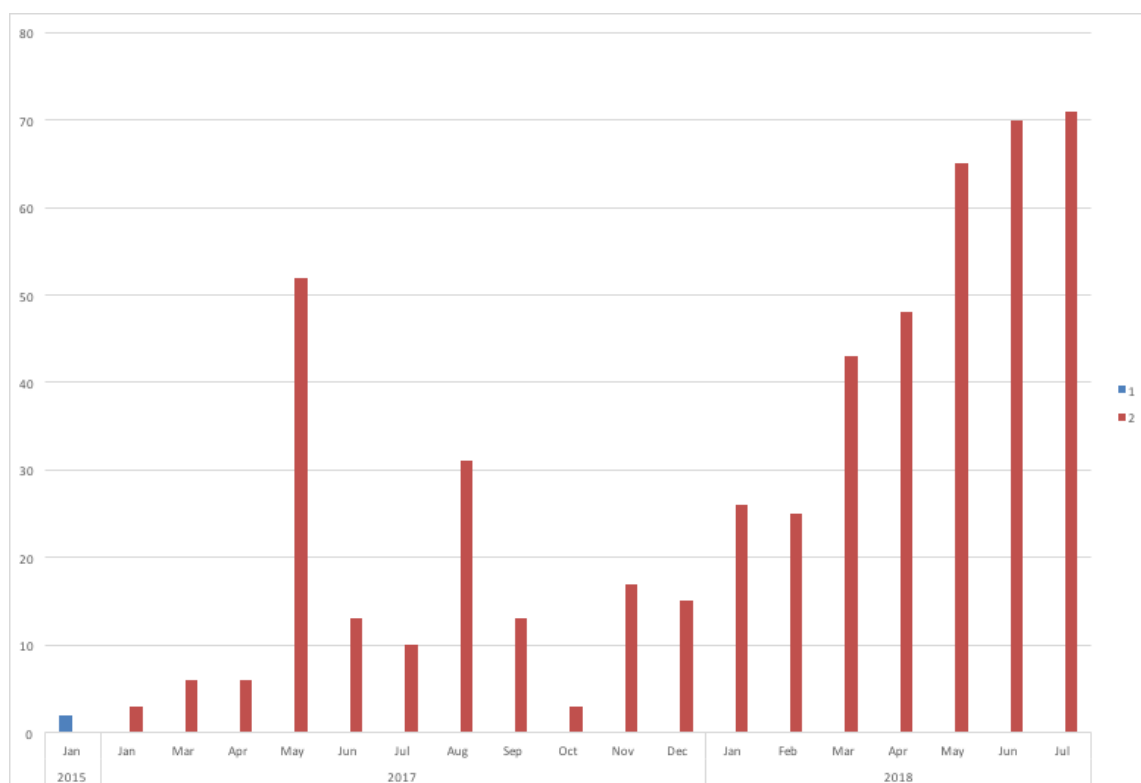
Arc Innovations does not have a battery replacement program, because they can't be replaced. Battery life is 15 years.

Every 4 months a report is run to check which metering installations are due for re-certification. Each time the list is evaluated and a decision is made to replace an existing meter with an EDML meter and to ask a trader to nominate NGCM as the MEP or to install its own asset and certify. Arc Innovations still hold some stock of meters which can be installed in a critical place to maintain the integrity of the RF Mesh. The number of meters due for recertification is steadily increasing and at some point the company will need to make a strategic decision on how to address this. One of the options is to use a statistical sampling method.

Arc Innovations provided a sample of the report for ARCS showing how many installations need to be recertified up to mid-2018.

Count of ICP		METER_CATEGORY		
Years	EIPC_EXPIRY_DATE	1	2	Grand Total
2015	Jan	2		2
2017	Jan		3	3
	Mar		6	6
	Apr		6	6
	May		52	52
	Jun		13	13
	Jul		10	10
	Aug		31	31
	Sep		13	13
	Oct		3	3
	Nov		17	17

	Dec		15	15
2018	Jan		26	26
	Feb		25	25
	Mar		43	43
	Apr		48	48
	May		65	65
	Jun		70	70
	Jul		71	71
Grand Total		2	517	519



Audit commentary

During the audit we identified 100 metering installations of category 2 and 7 of category 1 for which certification had expired.

It was discussed with the company and some of them are irrigation pumps (44) scheduled for recertification end of September/October. It also came to light that there is a possibility that the PSP dbase incorrectly calculates the length of certification for installations which were tested in situ. 31 installations could be effected. Arc Innovations will investigate further.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 7.1</p> <p>With: 10.38(a)</p> <p>From: 01-Apr-17</p> <p>To: 31-May-17</p>	<p>Certification expired for 103 metering installation (100 cat 2 and 3 cat 1)</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Twice previously</p> <p>Controls: Strong</p> <p>Breach risk rating: 2</p>		
Audit risk rating	Rationale for audit risk rating		
Medium	This could have an impact on settlement outcomes if discovered that installations record incorrect volumes		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>VAMS have a dedicated person managing these.</p> <p>A number of these ICPs had recently been recertified using the comparative method, however as the Arc systems are fully automated, we identified an issue where a technician was not updating all the component certification details and the site expiry date was being generated from the oldest component. Once this component was updated correctly in our system, the expiry date shifted out. Quite a few have also since been recertified, and the others either have work orders against them, are waiting for recertification, have customer issues, or are irrigation sites.</p> <p>There are 39 irrigation sites that are currently in the off season and are not currently used. Recertification will take place once irrigator power is restored. VAMS communicated this with the Retailer and both agreed this was a good outcome for all parties involved, particularly the customer. VAMS will contact the Retailer next month to start planning recertification.</p>		November 2017	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>VAMS produce a report looking forward at least 6 months in advance and this is continually managed and updated. We always plan on recertifying ICPs prior to the expiry date but other than the 39 irrigation sites which were intentionally left, there are often other unforeseen issues that cause recertification work to slip. These are managed with urgency on a case by case basis.</p>			

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

Arc Innovations uses two ATHs - VirCom EMS and Wells. Arc Innovation's technicians work under Wells ATH certification.

Audit commentary

According to the Electricity Authority's website, Wells and VircomEMS hold the certification of Test House, class B as per clause 4(2) of Schedule 10.3. The details are listed on the Electricity Authority website.

Audit outcome

Compliant

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

Arc Innovations does not provide the MEP services for metering installation category 3 and above

Audit commentary

Arc Innovations does not provide the MEP services for metering installation category 3 and above. This clause is not applicable.

Audit outcome

Not applicable

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

Arc Innovations does not provide the MEP functionality for metering installations for a point of connection to the grid.

Audit commentary

This clause is not applicable because Arc Innovations does not provide the MEP functionality for metering installations for a point of connection to the grid.

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

The measuring transformers (CTs) are part of category 2 metering installations. For all of these installations, CTs are used solely for metering purposes.

Audit commentary

Compliance is confirmed based on Arc Innovations's assurance. No physical inspection was conducted.

Audit outcome

Compliant

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

Arc Innovations does not have any installations which are certified at a lower category than would be indicated solely on the primary rating of the current.

Audit commentary

Compliance is confirmed based on Arc Innovations's assurance.

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

According to the process of re-certification of installations Arc Innovations's technicians always have a portable load for testing purposes. Arc Innovations does not install meters for new installations.

Audit commentary

Compliance was assessed based on the process used by Arc Innovations's technicians.

Audit outcome

Compliant

7.8. Results of testing of installation not within permitted error – 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

If the test conducted under clause 14(4) demonstrates that the metering installation is not within the relevant maximum permitted error, the cause of the problem will be investigated. PDA does not allow a technician to close a job. Equipment must be replaced and tests repeated. Only when this is complete can the job be closed and the PSP database updated with new details.

Audit commentary

The re-certification process is structured in such a way that a job can't be closed if the test parameters shows that the installation is not within the relevant maximum permitted error. The process of re-certification of an installation achieves compliance.

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 market administrator, by no later than 10 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 market administrator 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 market administrator 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

It was discussed with Arc Innovations during the audit if there are any metering installations of category 2, where the company has an access issue to the transformer.

Audit commentary

Compliance confirmed based on Arc Innovations statement.

Audit outcome

Compliant

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

Legacy meters for which ARCM provides the MEP services do not have time keeping devices.

Audit commentary

Arc Innovations does not have these type of meters installed as part of metering installations for which they provide the MEP services therefore compliance was not accessed.

Audit outcome

Not applicable

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 10 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

During the day ripple receivers are replaced when a technician is on site and the PSP database is updated with the details.

At night, a contractor who attends a faulty installation (usually for a lack of hot water) bridges out a ripple receiver. A trader is notified the following day and asked to issue a SR to Arc Innovations asking to replace the faulty equipment.

Audit commentary

Replacement of a ripple receiver is handled through the business as usual process. It is the same process which is used for dealing with faulty installations or scheduled re-certification.

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

All ripple receivers for which Arc Innovations is the MEP are certified. The company confirmed that they do not have, to their best knowledge, installations where a control device could affect the accuracy or completeness of the information for the purpose of Part 15.

Audit commentary

Compliance was assessed based on Arc Innovations statement. They have never received such a notification from any trader. However, if notified or identified by a technician that a control device could be unfit for its purpose, it is replaced.

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

In 2015 the smart meters certification was extended to 15 years therefore there was no need to use a statistical sampling process for Innovations to re-certify a group of category 1 metering installations.

Audit commentary

The process of statistical sampling was not used.

Audit outcome

Not applicable

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 a 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 10 days of certification of the installation.

In all other cases the MEP must advise the registry of the compensation factor.

Audit observation

Arc Innovations does not provide the MEP's functionality for any installation that is an NSP.

Audit commentary

Compliance was not assessed.

Audit outcome

Not applicable

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

All installations are metered using generation G1 and G2 meter/controllers. If an installation is identified as faulty and the installation is in a critical location, ARCS will use their own equipment. Meters and controllers are individually tested. Arc Innovation provided the Meter Certificate of Calibration for meters done by Delta Utility Services.

Audit commentary

Arc Innovations provided 6 Revenue Meter Certification of Calibration documents. Each of them contained on average 50 meters. The company also provided 11 randomly chosen EIPC Certificate/Electrical Safety Certification with corresponding Revenue Meter Certification of Calibrations to assist in the assessment for compliance with this clause.

Audit outcome

Compliant

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

Arc Innovations install CTs for metering installations category 2, certified by TWS. During site certification old CTS are removed and new ones installed which are later on sent to TWS for recertification.

Audit commentary

The company provided 11 randomly chosen EIPC Certificate/Electrical Safety Certifications with corresponding Metering Current Transformer Test Certificates to assist in the assessment of compliance with this clause.

Audit outcome

Compliant

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

Arc Innovations installs two types of smart meters. G1 meters, which consist of a meter and a controller. G2 meters where a data storage device is an integral part of a meter. All controllers are certified. A controller and meters and CTs (cat 2) are recorded in the CJR (Closed Job Report) and transferred to PSP.

Audit commentary

The company is exempt (#168) from populating the registry with controller serial numbers. We reviewed the EIPC Certificate/Electrical Safety Certification for a number of installations to confirm compliance. The process adopted by Arc Innovations does not allow the installation of uncertified controllers.

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 notified 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 10.43 to 10.48.

Audit observation

Arc Innovations understands clause 7 and if it occurs will take appropriate action.

Audit commentary

The process is not documented; it is prudent to assume that it does not happen. We would expect that it would be a major undertaking for all participants if an ATH's approval expires.

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

This clause is not applicable any more.

Audit commentary

Audit outcome

Not applicable

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 120 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, a sample of the category 1 metering installations selected under clause 45(2) of Schedule 10.7 has been inspected by an ATH.*

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

Arv Innovations has in place a statistical sampling inspection regime for category 1 metering installations as per the Code requirements.

In 2016, 500 metering installation must be inspected. Arc Innovations selected 595 ICPs. Total sample size actually inspected 500. The customer at each ICP was contacted by letter or phone to advise them of the impending inspection.

The summary of findings is shown in the table below:

Count of ICPs	Description of Non-compliance:
13	EIPC sticker
44	Meter readings
9	Seals
5	Component certification sticker
1	Tampering
3	Cabling
(71 unique ICPs failed)	NOTE: ICP which had multiple non compliances have been counted more than once above

Defects identified that have affected the accuracy or integrity of the raw meter data recorded by the metering installation were listed in the report. The majority (35) of these have lost or gained, on average, around 24 units over 7-9 years.

9 installations had larger discrepancies which were raised as jobs requiring a visit to the site and correction.

Audit commentary

Compliance confirmed based on a review of the report provided to the Authority and action taken by the company.

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:

- 120 months for Category 2
- 60 months for Category 3
- 30 months for Category 4
- 18 months for Category 5.

Audit observation

Arc Innovations provides the MEP services for metering installations of category 1 and 2 where their equipment is installed. The company policy is not to inspect installations of category 2, instead they will be re-certified. During this audit it was identified that 100 metering installations of category 2 were neither inspected nor re-certified.

Audit commentary

Non-compliance identified. This section should be read in conjunction with section 8.2 where it is explained why 100 metering installations of category 2 were not inspected.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 8.2 With: 46(1) of Schedule 10.7 From: 01-Mar-17 To: 31-May-17	100 metering installations category 2 were not inspected. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Medium	This could have an impact on settlement outcomes if discovered that installations record incorrect volumes		
Actions taken to resolve the issue		Completion date	Remedial action status
All Arc Cat 2 meters are certified for 10 years, we do not inspect Cat 2 ICPs, rather we replace with EDM. The number 100 is a direct relation to audit reference 7.1 'Certification expired for 103 metering installation (100 cat 2 and 3 cat 1)'. All 100 Cat 2 meters are currently uncertified and will be recertified in the next couple of months. All Cat 1 meters are inspected using statistical sampling.		November 2017	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
We do not inspect our Cat 2 metering installations as all Arc Cat 2 are 10 year certified. All meters are upgraded to EDM when expiry date is due.			

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

Arc Innovations's technicians work under Wells ATH. Once inspections are complete, the results are compared with records held by the company, which are stored in PSP.

Audit commentary

Compliance is confirmed based on the process used.

Audit outcome

Compliant

8.4. Broken or removed seals (Clause 48(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) 3 business days, if the metering installation is category 3 or higher*
- b) 10 business days if the metering installation is category 2*
- c) 20 business days if the metering installation is category 1.*

Audit observation

Arc Innovations installations are remotely read, therefore the chances that a broken or removed seal are noted are quite slim. The only time sites are visited is during a fault investigation or inspections.

During statistical sampling an inspection technician found 9 installations where seals were broken. Seals were replaced.

Audit commentary

The process is that where an Arc Innovations technician finds a broken seal at a category 1 or 2 metering installation they will check the installation for tampering and then replace the missing seals.

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) 10 business days for Category 2 and*
- c) 5 business days for Category 3 or higher.*

Audit observation

Arc Innovations provided the MEP's services for metering installations category 1 and 2. When Arc Innovations is notified or becomes aware that a metering installation maybe inaccurate (data validation), defective, the Solution Team evaluates if the ICP is in so called "critical area" or not. If the ICP is in a critical area a job is created and a technician goes on site. If necessary, an equipment is replaced and an installations recertified. Once job is complete a Closed Job Report is filed and provided to a trader with all information.

If the ICP is in non-critical area, it is passed to AMs to take care of it. A trader is asked to nominate NGCM as the MEP.

Audit commentary

To assess compliance and to see how the process works we asked Arc Innovations to provide 20 randomly chosen jobs, so -called repair jobs. We confirm the process was followed.

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 5 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

Testing of faulty installations of category 1 and 2 will be carried out by Arc Innovations's technicians working under Wells ATH accreditation.

Audit commentary

The test conducted by a technician on site is described in a manual which was approved by Wells ATH.

Audit outcome

Compliant

9.3. Statement of Situation (Clause10.46(2))

Code reference

Clause10.46(2)

Code related audit information

Within 3 business days of receiving the statement from the ATH, the MEP must provide copies of the statement to:

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

Audit observation

Arc Innovations works under Wells ATH accreditation, the required testing is carried out to assess a situation and fixed when required. A Closed Job Report constitutes a statement of situation.

Audit commentary

A statement of situation does not have to be provided to the Market Administrator as Arc Innovations provides services to category 1 and 2 metering installations only. They are available on request. It is a standard process adopted by the company.

Audit outcome

Compliant

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 10 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

ARCS regularly (daily or monthly) provides HHR and NHH data to traders, who they have contracts with. Data is provided in a format agreed to by both parties.

Audit commentary

Arc Innovations stated that they have not been asked by the Authority, an ATH or an auditor, to have access to raw meter data since the last audit. If such a request is made the requirements will be met.

For installations where legacy meters are installed, ARCM is not able to provide access to raw meter data as these meters are read manually by companies (meter readers) appointed by the traders

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

Arc Innovations does not give access to raw meter data to companies which are not authorised to receive it.

Audit commentary

The company commented that since the last audit there were no situations where any circumstances listed in clause 2(1) occurred.

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 10 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

Arc Innovations will use its best endeavours to arrange access to a metering installation if requested by parties listed in this clause.

Audit commentary

Physical access to each component in a metering installation is solely dependent on the customer's availability or health and safety concerns due to the nature of the customer's business. The customer determines if access is granted within 10 business days. A contractual arrangement between Arc Innovations and traders puts the obligation on Arc Innovations to request, from them, permission to access customer's metering installations.

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

Arc Innovations will use their best endeavours to provide physical access but it could be restricted by a customer's own regulations.

Audit commentary

Arc Innovations commented that such a request has not been made since the last audit.

Audit outcome

Compliant

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

Code reference

Clause 8 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 malfunctioning or tampering, and if this is detected, carry out the appropriate requirements of Part 10.

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

The PR-255 file showed that, for ARCM's installations, an interrogation cycle is 365 days. They are legacy meters read by metering companies appointed by traders. For ARCS installations an interrogation cycle is 30 days (meter model G1) and 1 day (meter G2). Meters G2 are installed for 16% of installations. The reason the Gen 2 is only 1 day is due to the limitation of the GE meter, where it could lose time if there was an extended power outage lasting 6 or more days. The interval and event data storage capacity is the same as for G1 so data is not lost if an interrogation cycle is missed. Arc Innovations would only start to lose interval data if a 40-day period elapsed without it being interrogated. As all G2 meters use the RF Mesh comms technology they are interrogated at least twice a day.

ARCS also has 4 ICPs for which the interrogation cycle is "0", they are NHH meters in Central Hawkes Bay. They will be replaced shortly by AMS meters.

For any sites from which data can't be read, a job is issued and a technician is sent to investigate.

Arc Innovations explained that for smart meters the maximum interrogation cycle depends on the model of controller being installed. For all Gen 1, it is 30 days, and for Gen 2, it is 1 day. These figures were determined when EGR D4 type tests were undertaken and is based on the data retention capabilities of the device, plus 5 business days

For "vanilla" meters (ARCM), there is no issue with data being lost, so the maximum interrogation cycle is 365. It is based on the Code requirements that meters must be physically read at least once a year.

For any sites from which data can't be read, a job is issued and a technician is sent to investigate

The Arc Innovations' data collection system is kept on New Zealand standard time. The base station, which communicates with loggers is synchronized multiple times per day, and error does not exceed +/- 5 sec at any time.

Table 1, of clause 8(5), of Schedule 10.6, the maximum permitted time errors for NHH category 1 & 2 metering installations is ± 60 sec and for half-hour installations " ± 30 sec" and " ± 10 sec".

There are three ways in which loggers are interrogated and how time synchronisation is carried out.

1. GPRS - read once per day, time synchronisation is carried out at every read.
2. Satellite - read 3 times per month, time synchronisation is carried out at every read
3. RF mesh read twice per day – the way in which RF mesh operates is that a special relative time adjustment message is sent to synchronise the loggers' time clock, if required, once per week. The

majority of loggers are read via RF Mesh. The system adjusts time for meters installed at category 1 to ± 30 sec and cat 2 to ± 5 sec. The process is fully automated.

Every time a meter interrogated the system, it records the time, the date, and extent of changes in the internal clock settings. It is a fully automated process. An example of the log is shown below. This screen does not show by how many seconds the time was adjusted. We viewed the entries in the PSP database.

Account 0007072120RN475 - MR I & MRS j SOKOLOV PEARSON Electric Kiwi

History

RF Mesh

Mesh Address: 91.00.11.D6

Push Data Freq: 0

Lat Long: 43 34 20.370 S 172 41 53.778 E C 0

6 Byte Address: 8D.F8.33.D6.76.20

Via Address:

UToP: UToP CHCH-D [80.70.4B.6D]

Active: ☒

PDA GPS: 43 34 20.370 S 172 41 53.778 E

Last Updated: 25/02/2008 00:00:00

Variance(Kms): 0.00

Radio Commands Sent:

Date	Time	User Id	Description	Response	Response TimeStamp	Round Trip Time (secs)
1/08/2017	11:20:47	Pow	RF Mesh Set Time	DONE 201040ms	1/08/2017 11:24:08	201
29/05/2017	04:29:06	Pow	RF Mesh Set Time	DONE 239939ms	29/05/2017 04:33:06	240
11/05/2017	16:28:28	Pow	RF Mesh Set Time	DONE 245203ms	11/05/2017 16:37:07	519
24/04/2017	16:28:06	Pow	RF Mesh Set Time	DONE 239360ms	24/04/2017 16:32:05	239
10/04/2017	16:27:33	Pow	RF Mesh Set Time	DONE 215916ms	10/04/2017 16:31:09	216
30/03/2017	17:27:08	Pow	RF Mesh Set Time	DONE 241136ms	30/03/2017 17:31:10	242
17/03/2017	05:26:40	Pow	RF Mesh Set Time	DONE 203450ms	17/03/2017 05:30:04	204
7/03/2017	05:26:17	Pow	RF Mesh Set Time	DONE 205883ms	7/03/2017 05:30:10	233
25/02/2017	05:25:58	Pow	RF Mesh Set Time	DONE 187175ms	25/02/2017 05:29:05	187
17/02/2017	17:26:10	Pow	RF Mesh Set Time	DONE 238742ms	17/02/2017 17:30:09	239
10/02/2017	06:29:34	Pow	RF Mesh Set Time	DONE 210815ms	10/02/2017 06:33:05	211
3/02/2017	18:29:11	Pow	RF Mesh Set Time	DONE 236878ms	3/02/2017 18:33:08	237
25/01/2017	18:28:58	Pow	RF Mesh Set Time	DONE 230938ms	25/01/2017 18:32:49	231

There is a report which summarizes which metering installations do not meet the criteria of Table 1. Every week this report is analysed and for installations which have repeated failures to update times a job is issued to replace equipment if necessary. Depending on where an ICP is located, it is passed to AMS or it stays with ARCS as the MEP.

During each interrogation of a metering installation, the event log is downloaded. The data coming back is thoroughly analysed by the Operation Team. It also includes checking for evidence of malfunction or tampering.

Audit commentary

To assess compliance, we analysed Metering Information files for both ARCM and ARCS from the length of the interrogation cycle point of view. The Arc Innovations's operation is constantly changing, there are less and less legacy meters. Legacy meters are not read by the Arc Innovations back office. Also the number of HHR meters for which ARCS is responsible is decreasing. The process for reading HHR meters has not changed since the last audit. The reads and time adjustment are fully automated. We walked through a weekly report of meters' time adjustments and the process for how they are evaluated. Any details of interrogation are recorded and easily accessible for auditing purposes. Raw metering data is held indefinitely. The access to raw metering data is restricted to authorised personnel.

Audit outcome

Compliant

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

Raw meter data is stored in the PSP database and the data cannot be altered. Arc Innovations does not modify or estimate data. The system does not have such a functionality.

Audit commentary

Access to raw meter data is limited to authorised personnel, the security of data is one of the priorities for the company.

Files, in the agreed format, are created and sent to traders, and their copies are retained in an archive directory.

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

Our observations were described in section 10.5

Table 1, of clause 8(5), of Schedule 10.6, the maximum permitted time errors for NHH category 1 & 2 metering installations is ± 60 sec and for half-hour installations " ± 30 sec" and " ± 10 sec".

There are three ways in which loggers are interrogated and how time synchronisation is carried out.

1. GPRS - read once per day, time synchronisation is carried out at every read.
2. Satellite - read 3 times per month, time synchronisation is carried out at every read
3. RF mesh - read twice per day. The way in which RF mesh operates is that a special relative time adjustment message is sent to synchronise the loggers' time clock, if required, once per week. The majority of loggers are read via RF Mesh. The system adjusts time for meters installed at category 1 to ± 30 sec, and cat 2 to ± 5 sec. The process is fully automated.

Every time a meter interrogates the system, it records the time, the date, and extent of changes in the internal clock settings. It is a fully automated process. An example of the log is shown below. This screen does not show by how many seconds the time was adjusted. We viewed the entries in the PSP database.

Account 0007072120RN475 - MR I & MRS J SOKOLOV PEARSON Electric Kiwi

History

RF Mesh

Mesh Address: 91.00.11.D6

Push Data Freq: 0 Send Freq

Lat Long: 43 34 20.370 S 172 41 53.778 E C 0

6 Byte Address: BD.F8.33.D6.76.20 Discover

Via Address:

UToP: UToP CHCH-D [80.70.48.6D] Locate UToP

Active: ☒ Init Poll

PDA GPS: 43 34 20.370 S 172 41 53.778 E

Last Updated: 25/02/2008 00:00:00

Variance[Kms]: 0.00

Radio Commands Sent:

Date	Time	User Id	Description	Response	ResponseTimeStamp	Round Trip Time (secs)
1/08/2017	11:20:47	Pow	RF Mesh Set Time	DONE 201040ms	1/08/2017 11:24:08	201
29/05/2017	04:29:06	Pow	RF Mesh Set Time	DONE 239939ms	29/05/2017 04:33:06	240
11/05/2017	16:28:28	Pow	RF Mesh Set Time	DONE 245203ms	11/05/2017 16:37:07	519
24/04/2017	16:28:06	Pow	RF Mesh Set Time	DONE 239360ms	24/04/2017 16:32:05	239
10/04/2017	16:27:33	Pow	RF Mesh Set Time	DONE 215916ms	10/04/2017 16:31:09	216
30/03/2017	17:27:08	Pow	RF Mesh Set Time	DONE 241136ms	30/03/2017 17:31:10	242
17/03/2017	05:26:40	Pow	RF Mesh Set Time	DONE 203450ms	17/03/2017 05:30:04	204
7/03/2017	05:26:17	Pow	RF Mesh Set Time	DONE 205883ms	7/03/2017 05:30:10	233
25/02/2017	05:25:58	Pow	RF Mesh Set Time	DONE 187175ms	25/02/2017 05:29:05	187
17/02/2017	17:26:10	Pow	RF Mesh Set Time	DONE 238742ms	17/02/2017 17:30:09	239
10/02/2017	06:29:34	Pow	RF Mesh Set Time	DONE 210815ms	10/02/2017 06:33:05	211
3/02/2017	18:29:11	Pow	RF Mesh Set Time	DONE 236878ms	3/02/2017 18:33:08	237
25/01/2017	18:28:58	Pow	RF Mesh Set Time	DONE 230938ms	25/01/2017 18:32:49	231

A weekly report is run to monitor compliance with the above clause.

Timesync_Success records the time drift assessed and a correction is successfully applied bringing CPE within the threshold for Cat1/Cat2.

Timesync_Failure reports each instance where a time correction message has failed to correct a site. There can be multiple failed attempts during the week that each report covers.

From the Timesync_Failure report unresponsive sites are selected for repair either remotely by Network & CPE or by a physical repair job. It is classed as a metering installation being inaccurate as per clause 10.43 (4).

Audit commentary

The report described above is analysed and for installations which have repeated failures to update time a job is issued to replace equipment if necessary. Depending on where an ICP is located, it is passed to AMS or it stays with ARCS as the MEP. During our visit we analysed the report dated 27 May 2017. 722 ICPs were listed in this report. 125 ICPs were read via GPRS and 597 RF Mesh. The report is split in 2 parts, Time sync successful and Time sync failure. It contained 371 ICPs which were contacted a few times but gained no response. The list of successful time sync contains a number of ICPs for which the time drift is quite high.

The process of time sync is fully automated and it looks as though Arc Innovations does not have the ability to determine how many ICPs are outside of the parameters required by the Code. Time drift for some meters is quite high even 2015 sec but when checked during the audit it was down to 30 sec. It appears that some controllers have a problem with maintaining the time within the parameters therefore it is very important to update them regularly. It is done every time they are read.

We would like to record this as an issue as it seems to be that not many metering installations are referred for replacement even though they are inaccurate from the point of view of time drift. Perhaps, because the Arc Innovations equipment is being slowly replaced by AMS, the company prefers to spend less money on the repair of equipment which will only be replaced in the foreseeable future.

Audit outcome

Compliant

Issue	Description	Remedial action
Time errors	Decreased number of metering installations being referred for replacement because of time errors	

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

This was already briefly described in section 10.5. During each interrogation of a metering installation, the event log is downloaded. The data coming back is thoroughly analysed. It also includes checking for evidence of malfunction or tampering. It is the daily task of the Operation team to evaluate and address any issues before data is sent to traders. It has a very well defined set of instructions as to how to address an error message.

Audit commentary

During this audit we spent a considerable amount of time with the Operation Team to assess compliance. The document Verification Error Identification-Management.docx describes all error

messages and how to manage them. It has well written instructions which are followed to the letter. Since last year's audit the Operational Team has an additional tool called the "NO reads database", which has greatly assisted in addressing any error messages.

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.

Audit observation

As described previously, during each interrogation the event log is downloaded. There is thorough analysis of the data coming back by the Operational Team. If any of the validation conditions are not met it results in a recording error code. Below is a table showing, for a particular ICP/CPE, how each day of August, the data was verified and logged. It is an automated process running in the background. If there was a discrepancy, an error would be generated and the Operational Team will investigate. If the requirement of clause 8(9) of Schedule 10.6 was not met it would result in a number of error codes displayed such as 107,108,114,118 or a combination.

Meter Reading Transactions: Account 0007072120RN475 - MR I & MRS j SOKOLOV PEARSON				
CPE #:	10046014	Meter:	1	Meter 1 History:
				Start Date
				End Date
				Gentrack #
				Serial #
				20/08/2015
				31/12/2999
				Unknown
				60B07L01010
Date(/Time)	Type	Gentrack Meter #	Meter Reading	Status
10 August 2017	Std Meter Data	SN: 60B07L010109	59569	Passed Verification
09 August 2017	Std Meter Data	SN: 60B07L010109	59566	Passed Verification
07 August 2017	Std Meter Data	SN: 60B07L010109	59531	Passed Verification
06 August 2017	Std Meter Data	SN: 60B07L010109	59527	Passed Verification
03 August 2017	Std Meter Data	SN: 60B07L010109	59484	Passed Verification
02 August 2017	Std Meter Data	SN: 60B07L010109	59467	Passed Verification
01 August 2017	Std Meter Data	SN: 60B07L010109	59451	Passed Verification
31 July 2017	Std Meter Data	SN: 60B07L010109	59442	Passed Verification
30 July 2017	Std Meter Data	SN: 60B07L010109	59435	Passed Verification
29 July 2017	Std Meter Data	SN: 60B07L010109	59428	Passed Verification
28 July 2017	Std Meter Data	SN: 60B07L010109	59421	Passed Verification
27 July 2017	Std Meter Data	SN: 60B07L010109	59414	Passed Verification
26 July 2017	Std Meter Data	SN: 60B07L010109	59390	Passed Verification
25 July 2017	Std Meter Data	SN: 60B07L010109	59344	Passed Verification
24 July 2017	Std Meter Data	SN: 60B07L010109	59327	Passed Verification
23 July 2017	Std Meter Data	SN: 60B07L010109	59306	Passed Verification
22 July 2017	Std Meter Data	SN: 60B07L010109	59281	Passed Verification
21 July 2017	Std Meter Data	SN: 60B07L010109	59250	Passed Verification

Below is another screen showing data when validation was not passed.

No Reads: <input type="checkbox"/> Read Errors: <input checked="" type="checkbox"/>		Last Processed Registry File Name: LIS-PR20170810030000355.txt, Last Processed Registry File Timestamp: 10/08/2017 03:39:25						
Search:		Read Error Date From:		Target Day From:		Read Error Status:	Resolved - Remote - 600kwh Rollover	Error Type: 105
ICP Number:		Read Error Date To:		Target Day To:		Read Type:		Rela
CPE Number:								Maxi
ICP Number	CPE Number	Read Type	Device Type	Retailer	Read Error Date	Target Day	Error Type	Error Status
3805002000CH1EB	116055	StandardRead	Meter 1	CTCT	10/08/2017	4	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007109814RNAB8	10092275	StandardRead	Meter 1	TODD	9/08/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007164679RN463	10140513	StandardRead	Meter 1	CTCT	8/08/2017	31	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007102531RN049	10107781	StandardRead	Meter 1	MERI	1/08/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0087010065WED8E	10131230	StandardRead	Meter 1	MERI	31/07/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0006565978RN6F7	10001431	StandardRead	Meter 1	GENE	24/07/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007144065RN21B	10129483	StandardRead	Meter 1	GENE	19/07/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0005665680RN3FC	10124275	StandardRead	Meter 1	CTCT	17/07/2017	15	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0006159397RN5F2	10053302	StandardRead	Meter 1	MERI	11/07/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007018894RN2DC	10088764	StandardRead	Meter 1	MERI	10/07/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0005921678RN230	10088667	StandardRead	Meter 1	MERI	27/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0006807004RN869	10116375	StandardRead	Meter 1	TODD	26/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007058357RN168	10112181	StandardRead	Meter 1	PRIME	25/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007104407RN4FA	10033704	StandardRead	Meter 1	MEEN	22/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007123510RN538	10041788	StandardRead	Meter 1	MERI	18/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0005173060RN76A	10121302	StandardRead	Meter 1	MEEN	18/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment
0007140725RN93C	10127062	StandardRead	Meter 1	MERI	12/06/2017	Daily	105 - Reading less than current value	Resolved - Remote - 600kwh Rollover Adjustment

To validate raw data after interrogation Arc Innovations's system has about 33 parameters which need to be met.

Below we are showing error messages which relate to compliance with clause 8 (9) of Schedule 10.6,

ID	Check / Rule	Description
107	Interval readings do not match previously recorded intervals	<p>Interval read data received from a meter which covers a complete interval period for which data has previously been received, must be equal to the consumption already recorded for those interval periods.</p> <p>Exception: Initialized meters will default all interval registers up to the time of initialization to ZERO. A zero value should be overwritten with newly received values if these values are non-zero. A zero value must not overwrite a non-zero value.</p>
108	Negative Interval readings encountered	Interval consumption data received from a meter must contain positive values only.
114	Invalid TOU Register	The Smart Meter has provided a read against a General Accumulation (GA) register that should not be in use (the smart meter is known but the GA register was not in use according to the tariff assigned to the smart meter as at the date/time of the read)

115	Sum of TOU registers does not = Total KWH	<p>The sum of the GA registers must match the Master Accumulator (MA) register (+/- a configurable threshold [default = 1KWh])</p> <p>Note: this check applies to smart meters operating in PostPay mode only.</p>
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Audit commentary

The validation of data is very thorough. Every day the Operational Team goes through all error messages, evaluates them and decides on the necessary follow up. The process is very well documented. Data which does not pass validation is not dispatched to traders.

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 10 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

The process is as follows. Every time a technician goes on site a trader needs to be advised in advance. Any work performed on an installation is reported in a Closed Job Report. Any questions from a participant, if they arise, are addressed promptly. If any correction factors need to be applied to submission information, the relevant reconciliation participant will be advised.

Audit commentary

Arc Innovations never corrects raw meter data. The system does not have such functionality. The access to raw metering data is restricted to authorised personnel.

The company commented that since the last audit there was no situation when the correction factor had to be applied to metering data because of a discovered inaccuracy of an installation.

Audit outcome

Compliant

CONCLUSION

PARTICIPANT RESPONSE

As stated in the summary, Arc does not accept nominations for new connections, they are passed to AMS, which becomes the MEP (NGCM). In certain circumstances, faulty Arc equipment is replaced with more Arc equipment, but only when it is to retain the integrity of the RF Mesh.

Arc Innovations does not install legacy meters any more. If a customer does not wish to have a smart meter installed, AMS installs a non-communicated smart meter, which is read by meter readers.

We believe we have strong controls across our systems but as always, there are areas where we can improve.

Our thanks again to the auditor who presented a fair snapshot of where Arc Innovations are as an MEP.