

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

For



Prepared by: Steve Woods – Veritek Limited

Date audit commenced: 10 May 2019

Date audit report completed: 27 May 2019

Audit report due date: 28-May-19

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EXECUTIVE SUMMARY

SmartCo is a Metering Equipment Provider (MEP) and is required to undergo an audit by 28/05/19, in accordance with clause 16A.17(b).

SmartCo is an MEP that is owned by a consortium of electricity network companies. SmartCo provides AMI data to retailers in member networks using mesh communications technology. The individual network companies that make up the consortium will be the owners of the meters in their networks. AMS has been appointed by SmartCo to provide metering, data collection and asset management services on SmartCo member networks. SmartCo will be the MEP on the registry (SMCO).

The audit identified 10 non-compliances and one recommendation is made.

Registry update timeliness continues to have a high level of compliance, with most of the late updates caused by late nomination by retailers. Whilst most registry fields are correct, there are a large number of ICPs with "IN24" recorded, which can lead to incorrect billing by retailers.

Three main issues were identified, and they contributed to four of the non-compliances, and 10 of the 19 future risk rating points. The three main points are as follows:

1. Two Category 2 metering installations were certified by Wells for two years, despite errors of 18% and 32%. Certification is cancelled, but recertification has not yet occurred. SmartCo is waiting for traders to arrange shutdowns so the CTs can be replaced.
2. 30 Category 2 installations were certified despite the burden being lower than the lowest test point. Certification is cancelled and the registry has not been updated.
3. Incomplete HHR data provided for 30,000 records during the change to NZST in April 2019. The 2nd interval was incorrectly recorded as zero.

I've recommended that the sum-check process be reviewed to ensure sum-check failures are investigated and contributing factors addressed. This may have helped with the NZST change issue mentioned above.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The table below provides some guidance on this matter and it recommends an audit frequency of 12 months. I agree with this recommendation.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Provision of accurate information	2.5	11.2 and Clause 10.6	Registry not always updated as soon as practicable by SmartCo. Incomplete HHR data provided for 30,000 records during the change to NZST in April 2019. The 2 nd interval was incorrectly recorded as zero.	Moderate	Medium	4	Investigating
Registry notification timeframe	3.2	2 of schedule 11.4	Some registry updates later than 15 business days.	Strong	Low	1	Identified
Installation accuracy	4.3	4(1)(a) of schedule 10.7	Two metering installations with errors greater than 2.5%.	Strong	Medium	2	Identified
Changes to registry records	4.10	3 of schedule 11.4	Some records updated on the registry later than 10 business days. Five incorrect certification dates.	Strong	Low	1	Investigating
Provision of registry information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some registry records incomplete or incorrect.	Moderate	Low	2	Identified
Correction of registry errors	6.3	6 of schedule 11.4	Corrections not made within five business days.	Moderate	Low	2	Identified
Cancellation of certification	6.4	20 of Schedule 10.7	Certification cancelled, and registry not updated within 10 business days for 30 ICPs with low burden.	Moderate	Low	2	Disputed
Expired certification	7.1	10.38 (a)	Certification cancelled for three ICPs.	Strong	Medium	2	Identified

Interrogation cycle	10.5	8(2)(a)&(b) of Schedule 10.6	372 installations not interrogated within the interrogation cycle.	Moderate	Low	2	Identified
Time errors	10.7	8(4) of Schedule 10.6	381 examples of clock errors outside the allowable thresholds in the most recent reports.	Strong	Low	1	Identified
Future Risk Rating						19	
Indicative Audit Frequency						12 months	

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

RECOMMENDATIONS

Subject	Section	Recommendation	Description
Sum-check process	10.9	Regarding Clause 8(9) of Schedule 10.6	Investigate reasons for sum-check failure and resolve contributing issues.

ISSUES

Subject	Section	Recommendation	Description
		Nil	

1. ADMINISTRATIVE

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

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

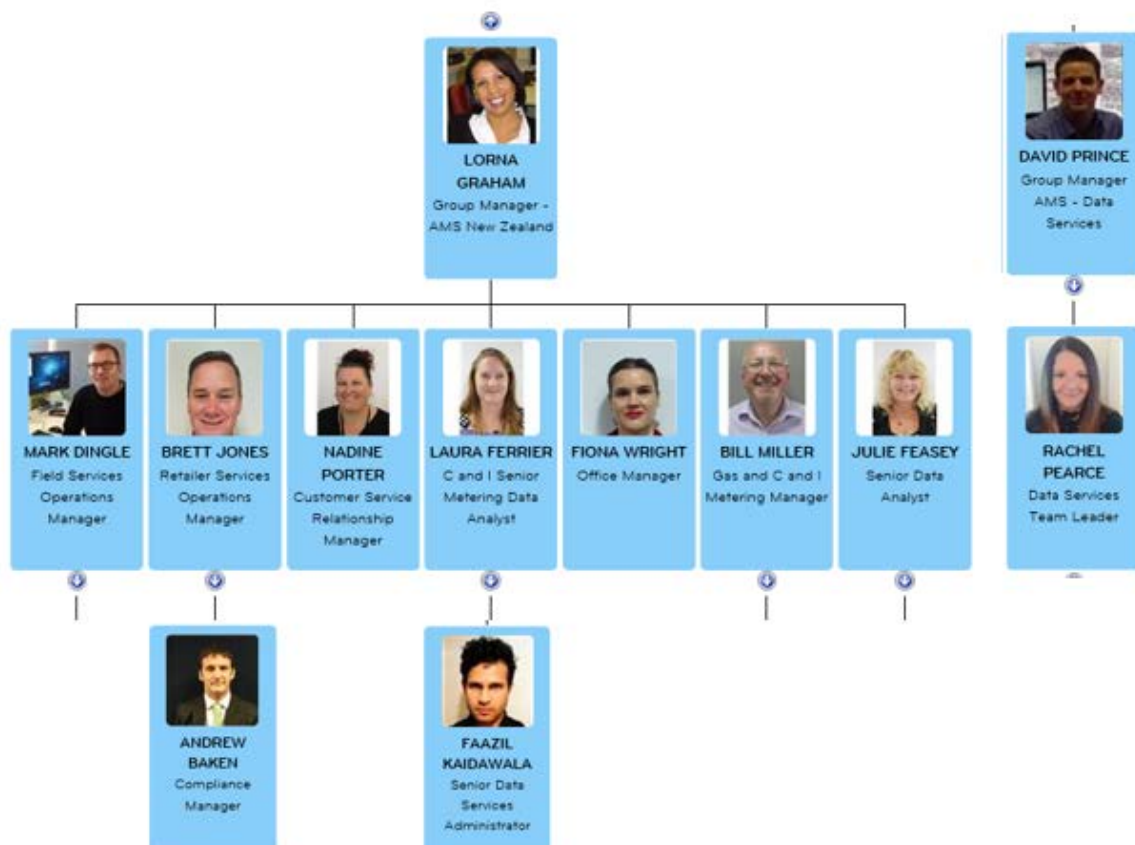
I checked the Electricity Authority website and I confirm there are no exemptions in place.

Audit commentary

I checked the Electricity Authority website and I confirm there are no exemptions in place.

1.2. Structure of Organisation

All SmartCo functions are performed by AMS; therefore, I have included the AMS organisation chart below.



1.3. Persons involved in this audit

Auditor: Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

SmartCo personnel assisting in this audit were:

Name	Title
Andrew Baken	Compliance Manager
Rachel Pearce	Data Services Team Leader
Andrea Grant	Senior Data Analyst

1.4. Use of Agents (Clause 10.3)

Code reference

Clause 10.3

Code related audit information

A participant who uses a contractor

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

Audit observation

SmartCo engages ATHs to conduct certification activities. ATHs are also engaged as agents to store records in accordance with clauses 4(1)(v) & (viii) of schedule 10.6. I checked that records were available from the relevant ATHs.

The ATHs engaged are as follows:

- Wells;
- Delta; and
- Vircom-EMS.

Audit commentary

The agreements between SmartCo and ATHs clearly specify that the ATHs are acting as an agent for these activities and they are required to produce records within five business days. The provision and accuracy of records is discussed further in **section 6**.

1.5. Hardware and Software

SmartCo MEP data is held in JDE and Salesforce. Both systems are subject to backup arrangements in accordance with standard industry protocols.

1.6. Breaches or Breach Allegations

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

1.7. ICP Data

Metering Category	Number of ICPs
1	133,498
2	1,406
3	0
4	0
5	0
9	0

1.8. Authorisation Received

A letter of authorisation was not required or requested.

1.9. Scope of Audit

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

SmartCo is an MEP that is owned by a consortium of electricity network companies. SmartCo provides AMI data to retailers in member networks using mesh communications technology. The individual network companies that make up the consortium will be the owners of the meters in their networks. AMS has been appointed by SmartCo to provide metering, data collection and asset management services on SmartCo member networks. SmartCo will be the MEP on the registry (SMCO).

The table below shows the relevant networks and metering equipment ownership for legacy and AMI equipment.

Metering Equipment Owner Codes

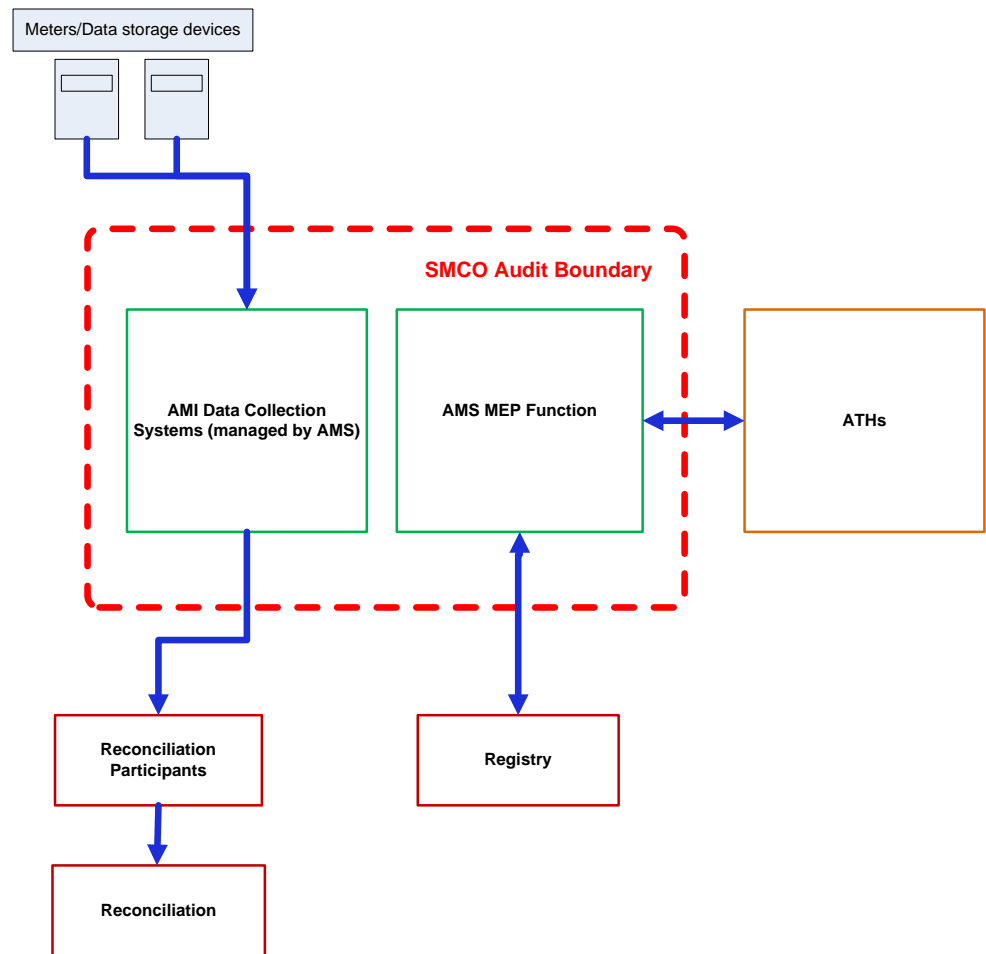
Network	MEO code (AMI Meters)	MEO Code (relays, legacy meters)	Meter Type
Alpine Network	ALPS	ALPE	L+G
Electricity Invercargill Network	ELIS	ELIN	EDMI
The Power Company Network	TPCS	TPCO	EDMI
MainPower	MPOS	MPOW	EDMI
Tasman Network	TASS	*	L+G
Top Energy	TOPS	WASN (LCD)	L+G

*Tasman Network will not have external load control devices left on site.

The table below shows a breakdown of ICPs per network as at May 2019.

Network	Quantity 2019	Quantity 2018	Quantity 2017	Quantity 2016
Top Energy	18,842	16,863	14,183	8,412
Alpine	24,888	18,994	12,375	3,685
Electricity Invercargill	11,697	8,650	5,877	2,316
Mainpower	26,605	24,690	16,136	6,210
Network Tasman	26,897	25,836	22,373	10,610
The Power Company	25,868	18,184	10,635	2,671
Mountain Power	107	77	38	0
Total	134,904	113,294	81,617	33,904

SmartCo collects AMI data as an MEP. The boundaries of this audit are shown below for greater clarity.



1.10. Summary of previous audit

The previous audit was conducted in May 2018 by Steve Woods of Veritek Limited. The table below shows that some of the issues have been cleared.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Provision of accurate information	2.5	11.2 and Clause 10.6	Registry not always updated as soon as practicable by SmartCo.	Still existing
Registry notification timeframe	3.2	2 of schedule 11.4	Some registry updates later than 15 business days.	Still existing
Uncertainty calculations	4.3	4(1)(a) of schedule 10.7	Error and uncertainty calculations not conducted correctly for up to 642 Category 2 metering installations.	Cleared
Changes to registry records	4.10	3 of schedule 11.4	Some records updated on the registry later than 10 business days. Five incorrect certification dates.	Still existing
Provision of registry information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some registry records incomplete or incorrect.	Still existing
Correction of registry errors	6.3	6 of schedule 11.4	Corrections not made within five business days.	Still existing
Cancellation of certification	6.4	20 of Schedule 10.7	Certification cancelled, and registry not updated within 10 business days for ICP 0000021432NT37F where only one phase is metered and four Category 2 installations where certification tests failed.	Still existing
Expired certification	7.1	10.38 (a)	Certification expired for five ICPs.	Still existing
Investigation of faulty metering installations	9.1	10.43(4) and (5)	Faulty meters not reported to traders within 20 business days.	Cleared
Testing of faulty metering installations	9.2	10.44	Statements of situation not arranged.	Cleared
Interrogation cycle	10.5	8(2)(a)&(b) of Schedule 10.6	737 installations not interrogated within the interrogation cycle.	Still existing

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Certification report clarity	5.1	Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Require Wells to provide better clarity with regard to summary information in certification reports.	Cleared

2. OPERATIONAL INFRASTRUCTURE

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

Code reference

Clause 10.9(2)

Code related audit information

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

Audit observation

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

Audit commentary

SmartCo has an AMI system and the services access interface is expected to be “remote”. I checked 70 certification records and found the services access interface was correctly recorded by all ATHs.

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

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 7(1) of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

SmartCo uses the SMCO identifiers for all MEP functions.

Audit outcome

Compliant

2.4. Communication Equipment Compatibility (Clause 40 Schedule 10.7)

Code reference

Clause 40 Schedule 10.7

Code related audit information

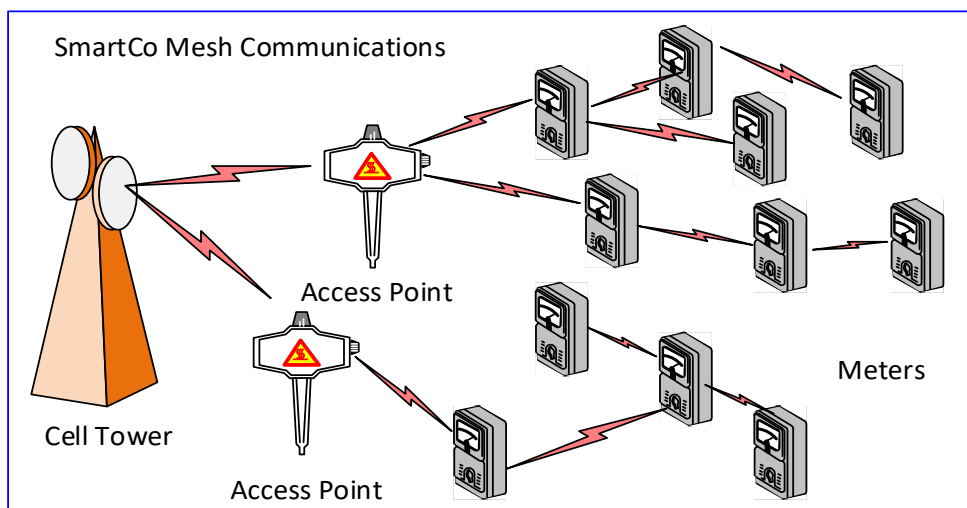
The MEP must ensure that the use of its communication equipment complies with the compatibility and connection requirements of any communication network operator the MEP has equipment connected to.

Audit observation

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

Audit commentary

SmartCo uses radio mesh technology for the transmission of data from meters to “Access Points” (as shown in the diagram below) and data from access points is transmitted using the cellular network. I checked all relevant documentation, which confirms compliance with all relevant requirements and standards.



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

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

Audit commentary

As mentioned in **section 6** there are some registry records which are not complete and accurate. SmartCo is attempting to correct information as soon as practicable, bearing in mind that there is often liaison with other parties and/or fieldwork involved. There are some metering installations with cancelled certification and the registry was not updated as soon as practicable.

Following the audit, a further issue was identified during a Retailer audit. It appears that during daylight saving adjustment in April 2019, at least 30,000 records for one Retailer had consumption in the second interval replaced with a zero. This does not achieve compliance with the requirement to provide complete and accurate information. This is currently being investigated as a high priority to ensure remedial solutions are robust.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11.2 and Clause 10.6 From: 01-May-18 To: 31-Mar-19	Registry not always updated as soon as practicable by SmartCo. Incomplete HHR data provided for 30,000 records during the change to NZST in April 2019. The 2 nd interval was incorrectly recorded as zero. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	Rationale for audit risk rating

Medium	<p>Controls are recorded as moderate because they mitigate risk most of the time, but some issues still occur.</p> <p>The impact on other participants is minor in relation to registry data, but the impact for missing interval data could be at least 100,000 kWh for the retailer mentioned; therefore, the audit risk rating is medium.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
We are working with the Retailer directly surrounding this issue and are investigating with high priority at our end. We have identified that the data is in the head end application and that the issue is downstream, likely in our meter data management system.		30 June 2019	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Once the problem is resolved this will eliminate any further issues.		30 June 2019	

3. PROCESS FOR A CHANGE OF MEP

3.1. Payment of Costs to Losing MEP (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

I checked if SmartCo had sent or received any invoices.

Audit commentary

SmartCo has not sent or received any invoices yet.

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

I checked the event detail for the audit period for all records where SmartCo became the MEP to evaluate the timeliness of updates.

Audit commentary

I examined an event detail report for the period 01/05/18 to 31/03/19 in relation to this clause and the findings are shown in the table below. The registry was updated within 15 business days for 77% of the sample. I checked a sample of 30 late updates and late nomination was the cause in all cases.

Year	ICPs Switched	Notified to registry within 15 days	Percentage compliant	Average days
2016	13,960	12,787	92%	8.6
2017	30,460	28,837	95%	4.4
2018	15,763	14,021	90%	7.7
2019	14,812	11,407	77%	14

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: Clause 2 of Schedule 11.4 From: 01-May-17 To: 31-Mar-18	Some registry updates later than 15 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are in place to ensure the timeliness of updates, but SmartCo is often prevented from updating the registry due to late field notification. The impact on other participants is minor; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
<i>'The registry was updated within 15 business days for 77% of the sample. I checked a sample of 30 late updates and late nomination was the cause in all cases.'</i> SmartCo is complying as much as it can in this instance, however there is still an issue of some retailers not nominating up front, which puts the MEP into a technical breach. AMS, the agent for SmartCo monitors where there is no nomination and chases retailers weekly.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Continue to monitor and chase retailers for nominations where applicable.		Ongoing	

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

Code reference

Clause 5 of Schedule 10.6

Code related audit information

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

On receipt of a request from the gaining MEP, the losing MEP has 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

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

Audit commentary

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

Audit outcome

Not applicable

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 MEP's 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

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

Audit commentary

SmartCo has ceased to be responsible for some metering installations and they still continue with their responsibilities, mainly in relation to the storage or records, which are kept indefinitely. As mentioned in **section 2.3**, some of these responsibilities will be met by ATHs on behalf of SmartCo.

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

I checked the design reports provided by SmartCo to the ATHs to confirm compliance.

Audit commentary

AMS has prepared design reports for SmartCo and has provided these to all ATHs. The reports include all of the requirements noted above and they were prepared by a person with the appropriate level of skills, expertise, experience and qualifications. There have not been any changes to design reports during the audit period.

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

I confirmed that SmartCo uses the ATHs recorded in **section 1.4**.

Audit commentary

AMS, on behalf of SmartCo, has the scope statements on record for all ATHs to ensure they are appropriate.

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

I checked the processes used by SmartCo to ensure compliance with the design and with the error thresholds stipulated in Table 1. I also checked the certification records for 49 metering installations.

Audit commentary

During the previous audit period, Wells ATH was not calculating uncertainty for Category 2 metering installations certified using the comparative method. This did not achieve compliance with clause 4(1)(a) of schedule 10.7. Wells has resolved this matter and uncertainty calculations are now compliant. There are three metering installations where the error is incorrectly recorded, but the overall error is within 2.5% and Wells has resolved this issue.

There were two installations certified by Wells where the error was not within 2.5%. ICP 0000931760NV71C was certified on 08/08/18 for a period of two years despite an error of 18%. ICP 0003860754TP8CD was certified on 06/08/18 for a period of two years despite an error of 32%. Certification was cancelled in the registry for both ICPs as soon as SmartCo received the certification reports. I've therefore concluded that SmartCo has strong controls to ensure 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. Remedial action has not yet occurred, and the errors are still present. SmartCo is waiting for traders to arrange shutdowns so that CTs can be replaced.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.3 With: Clause 4(1) of Schedule 10.7 From: 06-Aug-18 To: 19-May-19	Two metering installations with errors greater than 2.5%. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Strong Breach risk rating: 2
Audit risk rating	Rationale for audit risk rating

Medium	<p>I have recorded the controls as strong because the issues were identified immediately.</p> <p>There is a moderate impact on metering installation accuracy; therefore, the audit risk rating is medium.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
Both ICPs should not have been certified, Retailers were notified of the situation at the time and certification was immediately cancelled. Both sites require a shutdown to replace the CT's, this is currently with the Retailers and businesses to arrange a suitable time to return.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Both ICPs were incorrectly certified by the same test house, we have discussed this issue with them and provided further comms to all ATHs to ensure they do not recertify at all. In both cases our back-office processes picked up the errors and corrected the cert dates immediately.		Ongoing	

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

I asked SmartCo to confirm whether subtraction was used for any metering installations where they were the MEP.

Audit commentary

SmartCo does not have any metering installations where subtractive metering 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

I checked SmartCo's list file to confirm compliance with this requirement.

Audit commentary

I checked SmartCo's list file to confirm compliance with this requirement. There are no installations over Category 2.

Audit outcome

Compliant

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

Code reference

Clause 4(3) of Schedule 10.7

Code related audit information

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

Audit observation

I checked if SmartCo is responsible for any NSP metering.

Audit commentary

SmartCo is not the MEP for any NSP metering.

Audit outcome

Compliant

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

Code reference

Clause 10.26(10)

Code related audit information

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

Audit observation

SmartCo is not responsible for any grid metering.

Audit commentary

SmartCo is not responsible for any grid metering.

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

AMS's instructions to ATH's include several clauses in relation to physical and electrical characteristics. Compliance is confirmed.

Audit commentary

AMS's instructions to ATH's include several clauses in relation to physical and electrical characteristics. Compliance is confirmed.

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 installations:

- *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

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 3 of Schedule 11.4

Code related audit information

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

I checked the event detail report for the period 01/05/17 to 31/03/18 to evaluate the timeliness of registry updates.

Audit commentary

I examined the event detail report for the period 01/05/18 to 31/03/19 and the table below shows the results:

Event type	Year	Total	Total within 10 days	% Compliant	Average days
Update	2016	7,366	6,627	85%	13.8
	2017	10,465	9,624	92%	Unknown
	2018	25,679	23,077	90%	17
	2019	31,820	30,640	96%	8
New connection	2016	924	800	87%	8
	2017	2,055	1,826	89%	7.1
	2018	1,471	1,292	88%	7
	2019	2,158	2,022	94%	4

136 new connection updates were later than 10 business days. I checked 20 examples of late updates and late nomination was the cause for 18 of the 20. For the other two, one was late due to a processing delay and the other because of a system issue.

I checked the records in detail for all 28 ICPs where new connections had occurred and where the certification date was different to the initial energisation date or the retailer's active date. I found that certification dates were incorrect for four ICPs.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 4.10 With: Clause 3 of Schedule 11.4 From: 01-May-18 To: 31-Mar-19	Some records updated to the registry later than 10 business days. Four incorrect certification dates. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as strong because they mitigate risk to an acceptable level. Late updates for new connections can have a minor impact on participants and settlement, therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
There are a few ICPs where the certification date was different to the initial energisation date or the retailer's active date. We have been through the photos and are querying the discrepancy with the ATH concerned. This is to ensure that everyone's paperwork aligns. These will be corrected once we determine the correct date.		30 June 19	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Add this check to our reconciliation to capture and correct these sooner.		30 June 19	

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

SmartCo's metering infrastructure was examined as part of this audit to confirm compliance.

Audit commentary

SmartCo's metering infrastructure was examined as part of this audit and I confirm compliance.

Audit outcome

Compliant

4.12. Responsibility for Metering at ICP (Clause 10.23A)

Code reference

Clause 10.23A

Code related audit information

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

(a) if the metering equipment provider is responsible for interrogating the metering installation—

(i) arrange for a final interrogation to take place before the metering installation is decommissioned; and

(ii) provide the raw meter data from the interrogation to the trader that is recorded in the registry as being responsible for the ICP; or

(b) if another participant is responsible for interrogating the metering installation, advise the other participant not less than three business days before the decommissioning—

(i) of the date and time of the decommissioning; and

(ii) that the participant must carry out a final interrogation.

(2) To avoid doubt, if a metering installation at an ICP is to be decommissioned because the ICP is being decommissioned—

(a) the metering equipment provider is not responsible for arranging a final interrogation of the metering installation; and

(b) the trader that is recorded in the registry as being responsible for the ICP must arrange for a final interrogation of the metering installation under clause 11.18(3).

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

Audit observation

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

Audit commentary

There have not been any examples of this occurring during the audit period.

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

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

Audit commentary

There have been no examples of software, ROM or firmware changes for SmartCo, and a compliant process exists.

Audit outcome

Compliant

4.15. Temporary Energisation (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

I checked examples of insufficient load certification to determine whether there were any examples of temporary energisation for the purposes of testing. None were identified.

Audit commentary

I checked examples of insufficient load certification to determine whether there were any examples of temporary energisation for the purposes of testing. None were identified.

Audit outcome

Not applicable

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

I checked certification records for 90 metering installations to evaluate compliance with this clause.

Audit commentary

As mentioned in **section 1.4**, agreements between SmartCo and ATHs clearly specify to the ATHs that they are acting as an agent for the management of certification records, and they are required to produce these within five business days. I requested records for 70 metering installations and complete records were supplied for all 70.

During the previous audit I recorded that the Wells ATH records were difficult to read and some of the critical fields were difficult to identify. I recommended SmartCo require Wells to include the following information clearly on the first page of certification records:

1. ICP
2. Metering installation certification date
3. Metering installation certification expiry date
4. Electrical connection date (if known and if the ATH is also the electrical connection agent)
5. Metering Category
6. Certification type (selected component, comparative, fully calibrated, alternative, low load, lower category).

Wells has recently improved the readability and clarity of their certification reports.

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

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

Audit commentary

SmartCo has not been requested to supply any inspection reports and no inspections were conducted during the audit period.

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

I checked historic metering records to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 6 Schedule 10.6

Code related audit information

If the MEP contracts with an ATH to recertify a metering installation and the ATH did not previously certify the metering installation, the MEP must provide the ATH with a copy of all relevant metering records not later than 10 business days after the contract comes into effect.

Audit observation

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

Audit commentary

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

Audit outcome

Not applicable

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

I checked the switch breach history detail report to confirm whether all responses were within 10 business days.

Audit commentary

AMS has automated the MEP switch acceptance process for SmartCo based on certain NSPs where they approve the installation of their metering. This means the switch acceptance timeframes are mostly immediate. All acceptances were provided within 10 business days.

Audit outcome

Compliant

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 trader's system.

Audit observation

I checked the list file for 100% of records to identify discrepancies.

Audit commentary

Analysis of the list file and PR255 file for all ICPs found some discrepancies. The table below shows these and includes a comparison with the previous audit results.

Issue	2019 Quantity	2018 Quantity	2017 Quantity	2016 Quantity	Comments
SMCO is recorded on the registry as the MEP but the metering records have not been populated on the registry	0	0	0	3	N/A
Night with no day	0	0	1	3	N/A
CN only on residential ICP	6	1	4	0	3 resolved
Day and night not = 24	0	0	2	0	N/A
ICPs have "IN24". This is not a valid combination	15,532	16,205	17,695	10,828	
UN only with a control device. A check of 52 examples indicated that many should be INEM0 not UN24	353	266	Not checked	Not checked	
Incorrect certification duration	0	1	0	2	N/A
Category 2 without CTs recorded in the registry	1	0	2	0	Resolved
Incorrect metering category	0	9	0	0	N/A
CTs on Category 1 installation	0	1	0	0	N/A
Incorrect certification dates	31	5	-	-	

Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 6.2</p> <p>With: Clause 7 (1), (2) and (3) of Schedule 11.4</p> <p>From: 01-May-18</p> <p>To: 31-Mar-19</p>	<p>Some registry records incomplete or incorrect.</p> <p>Potential impact: Medium</p> <p>Actual impact: Medium</p> <p>Audit history: Multiple times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>
Audit risk rating	Rationale for audit risk rating
Low	<p>I have recorded the controls as moderate in this area. There are still a small number of areas where improvement can be made.</p> <p>Some of the discrepancies have a minor impact on participants, customers or settlement. The relevant ones in this regard are tariff related. The audit risk rating is low.</p>

Actions taken to resolve the issue	Completion date	Remedial action status
A number of the 52 UN sites with control devices are irrigation sites, these are incorrect and we believe they should be INEMO, these will be updated after we have worked through the rest of the list and confirmed the correct tariff for the others.	30 June 2019	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
We continue to monitor discrepancies through the reconciliation process, we will ensure these are captured as part of that.	30 June 2019	

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

Code reference

Clause 6 of Schedule 11.4

Code related audit information

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

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

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

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

Audit observation

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

Audit commentary

SmartCo has a number of checks in place to ensure registry data is correct. They are as follows:

- mandatory data missing from files being sent to registry;
- awaiting MEP nomination after eight days;
- registry rejections;
- MEP responsibility is lost, leading to a removal of assets and a stop of interrogation;
- a new MEP has accepted a switch request but SmartCo has a works order in progress;
- difference between SmartCo and the registry data for files sent;
- MEP switch reversal but a works order is in progress;
- ICP status is not valid on the registry (e.g. ready instead of active); and
- no MEP switch response file within the time period.

In addition to the points noted above, SmartCo is also conducting a complete validation for all fields in accordance with this clause. Whilst the validation processes are robust, some corrections are not made within five business days, which is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.3 With: Clause 6 of Schedule 11.4 From: 01-May-18 To: 31-Mar-19	Discrepancies not resolved within 5 business days. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as moderate because they mitigate risk most of the time, but some late updates still occur. Some of the discrepancies have a minor impact on participants, customers or settlement. The relevant ones in this regard are tariff related. The audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Our best intentions are to identify discrepancies and resolve them within the required 5 business days, however this does not always happen. Where activities require third party involvement, such as switch reversals or field visits, the 5 business days can be very challenging.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Continue to identify ways to resolve discrepancies as quickly as possible.		Ongoing	

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:

- the metering installation is modified otherwise than under sub clause 19(3) or 19(6)
- 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
- 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

I checked for examples of all of the points listed above, and checked whether certification had been cancelled, and whether the registry had been updated within 10 business days.

Audit commentary

I checked for Category 2 installations due for inspection. No installations were due for inspection.

The matter of "bypassed" metering was evaluated during the audit. There were no ICPs identified where the meter was bridged during the audit period. SmartCo has a process to recertify when this does occur.

Two Category 2 metering installations failed their recertification tests. The registry was updated within 10 business days.

The other issue relates to low burden on CT metered installations. The Authority provided a memo on 04/04/16 clarifying that:

The Electricity Industry Participation Code 2010 (Code) requires an ATH to ensure that an approved calibration laboratory or a class A ATH has confirmed that all measuring transformers comply with the standards in Table 5 of Schedule 10.1 (clause 3(b) of Schedule 10.8). If the errors are within the limits set by the standards, the transformer has passed the test and may be certified as accurate within that range of burden (clause 3 of Schedule 10.8 and Table 5 of Schedule 10.1).

If a measuring transformer is installed in a metering installation with the burden lower than the lowest test point used in the measuring transformer's calibration, then burdening resistors must be used to ensure that the measuring transformer operates within its calibration range.¹

The memo also states:

If an ATH certifies a metering installation with under-burdened measuring transformers, and it has not complied with clause 31(7) of Schedule 10.7 of the Code, then:

1. The ATH will breach clause 31(7) of Schedule 10.7 and also clause 43 of Schedule 10.7 by failing to grant certification in accordance with Part 10
2. The metering installation may be classed outside the applicable accuracy tolerances specified in Table 1 of Schedule 10.1, or not be fit for purpose, and if so, the metering installation certification is cancelled (clause 20(1)(b) of Schedule 10.7)
3. In certifying the metering installation, the ATH may breach clause 21 of Schedule 10.7 by certifying a metering installation that exceeds that maximum permitted error set out in Table 1 of Schedule 10.1.

30 Category 2 metering installations were certified with burden lower than the lowest test point, without a Class A ATH confirming that the measuring transformers will not be adversely affected. Therefore, in accordance with the Authority's memo, these metering installations are not considered "fit for purpose". This means certification is cancelled.

Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 6.4 With: Clause 20 of Schedule 10.7 From: 01-May-18 To: 19-May-19	Certification cancelled, and registry not updated within 10 business days for 30 ICPs with low burden. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
Low	I have recorded the controls as moderate in this area because most processes are managed with sufficient controls to avoid cancellation of certification. The installations with low burden are all recording within the allowable 2.5% therefore the impact on settlement is minor. The responsibility for SmartCo is to cancel certification on the registry once they know certification is cancelled and the impact of not doing this is minor, therefore the audit risk rating is low.	
Actions taken to resolve the issue		Remedial action status
This particular scenario was discussed in detail at the recent ATH/MEP forum run by the Authority. The outcome from this forum on whether CTs must be burdened during a comparative test was inconclusive. We are currently waiting for the Authority to provide a clear legal interpretation of the code on this subject. In the mean-time we do not believe these metering installations are non-compliant, and therefore, will hold off cancellation of certification until further notice.		Disputed

Preventative actions taken to ensure no further issues will occur	Completion date	
Once we have a definitive decision on the interpretation of the code, we will ensure all test houses meet this going forward.	Ongoing	

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

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

Audit commentary

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

Audit outcome

Compliant

7. CERTIFICATION OF METERING INSTALLATIONS

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

Code reference

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

Code related audit information

The MEP must obtain and maintain 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

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

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

Audit commentary

At the time of my analysis, three ICPs were showing as having expired certification. The table below shows the details.

ICP	Certification Type	Category	Expiry Date	Comments
0003860754TP8CD	F	2	7/08/2018	Certification cancelled due to failed certification tests.
0000931760NV71C	F	2	9/08/2018	Certification cancelled due to failed certification tests.
0000021432NT37F	F	1	23/04/2018	Single phase meter on 3 phase installation, certification cancelled.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 7.1 With: Clause 10.38 (a) From: 01-May-18 To: 19-May-19	Certification cancelled for three ICPs. Potential impact: High Actual impact: Medium Audit history: Once Controls: Strong Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Medium	I have recorded the controls as strong in this area because processes are in place to ensure certification is in place and is cancelled when required. The impact on settlement is recorded as moderate because two installations have inaccurate metering installations; therefore, the audit risk rating is medium.		
Actions taken to resolve the issue		Completion date	Remedial action status
As discussed in section 4.3, the two ICPs 0003860754TP8CD, and 0000931760NV71C are waiting for the Retailers to provide access to replace the CTs, as this requires a shut down it is taking longer than expected. ICP 0000021432NT37F is currently waiting on customer and retailer to update the switchboard to accept three phase meter. Until this happens this job cannot proceed.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Only very difficult jobs remain uncertified and like the three above, they usually require input from the customer, this puts the retailer and MEP in a difficult situation.		Ongoing	

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

I checked the certification records for 70 metering installations to confirm compliance. ATHs have shown that their processes include all tests and reports confirm tests are completed.

Audit commentary

Most certification activities have been conducted by Wells, VEMS and Delta. The most recent audit reports for all ATHs confirm the appropriate testing is conducted.

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

I checked the certification records for 10 metering installations to confirm compliance.

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 10.37(2)(b)

Code related audit information

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

Audit observation

This clause relates to Transpower as an MEP.

Audit commentary

This clause relates to Transpower as an MEP.

Audit outcome

Not applicable

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

Code reference

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

There are no examples of burden changes having occurred.

Audit outcome

Not applicable

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

Code reference

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

Code related audit information

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

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

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

If a meter is certified in this manner:

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

Audit observation

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

Audit commentary

The audit identified seven metering installations certified as a lower category. All installations have protection rated at 500A or less therefore monitoring is not required.

The ICPs are shown in the table below:

ICP	ATH	Certification date	CT ratio	Comments
0000365665MP339	VEMS	27/02/17	800/5	Main switch rating is less than 500A
0000373718MPD1A	VEMS	24/08/16	600/5	Fusing is 300A
0001031002AL012	WELL	17/01/17	600/5	315A fuses
0003586034ALCAD	WELL	24/01/17	600/5	400A fuses
0003651119AL322	WELL	15/12/16	600/5	250A fuses

0005721110ALC3F	WELL	13/01/17	600/5	400A fuses
0005742234AL3DB	WELL	30/10/16	600/5	400A fuses

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

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

Audit commentary

There were no examples of certification occurring under this clause. SmartCo has a clear instruction to ATHs that load must be added to perform certification testing.

Audit outcome

Compliant

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

Code reference

Clause 14(6) of Schedule 10.7

Code related audit information

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Not applicable

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 five business days, to any requests from the market administrator for additional information*
- *ensure that all of the details are recorded in the metering installation certification report*
- *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

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

Audit commentary

Alternative certification has not occurred. I confirmed this by checking the list file.

Audit outcome

Not applicable

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

I asked SmartCo whether there were any metering installations with timeclocks.

Audit commentary

All SmartCo metering installations are remotely monitored, therefore they don't need to be checked every 12 months.

Audit outcome

Compliant

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

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

Audit commentary

There were no examples during the audit period. Salesforce has an automated process to notify Traders once bridging has occurred.

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 three 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

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

Audit commentary

Most control devices are integrated within the meters and there is back office reporting to confirm switching has occurred, i.e. that a signal has been received. The event is called "relay stuck". This achieves

compliance with the intent of this clause. In cases where the control device is not integrated, there has not been any notification under this clause.

Audit outcome

Compliant

7.13. 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

I checked the certification records against the registry for 49 Category 2 metering installations and they were correct in all cases.

Audit commentary

I checked the certification records against the registry for 49 Category 2 metering installations and they were correct in all cases.

Audit outcome

Compliant

7.14. 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

I checked the certification records for 70 metering installations to confirm compliance.

Audit commentary

Meters were certified for all 70 metering installations.

Audit outcome

Compliant

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

Code reference

Clause 28(1) of Schedule 10.7

Code related audit information

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

Audit observation

I checked the certification records for 49 metering installations to confirm compliance.

Audit commentary

I checked the records for 49 CT metered installations, and I confirm CTs are certified in accordance with this clause.

Audit outcome

Compliant

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

Code reference

Clause 36(1) of Schedule 10.7

Code related audit information

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

Audit observation

I checked the certification records for 70 metering installations to confirm compliance.

Audit commentary

Data storage devices were certified for all 70 metering installations.

Audit outcome

Compliant

7.17. 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

I checked the ATH register to confirm compliance.

Audit commentary

All relevant ATHs have appropriate approval.

Audit outcome

Compliant

7.18. 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

I checked the registry records (PR255) to identify any ICPs with interim certification recorded.

Audit commentary

There are no metering installations with interim certification.

Audit outcome

Compliant

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 two 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

SmartCo has not been required to conduct any Category 1 inspections.

Audit commentary

SmartCo has not been required to conduct any Category 1 inspections.

Audit outcome

Compliant

8.2. 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

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

Audit commentary

Statistical sampling has not occurred during the audit period.

Audit outcome

Not applicable

8.3. 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

SmartCo has not been required to conduct any Category 2 inspections.

Audit commentary

SmartCo has not been required to conduct any Category 2 inspections.

Audit outcome

Not applicable

8.4. 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

SmartCo has not conducted any inspections.

Audit commentary

SmartCo has not conducted any inspections.

Audit outcome

Not applicable

8.5. 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) *three 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

AMS has a documented process in place for the management of seals and any subsequent investigation and reporting. There were no specific examples to examine where seals were broken but I examined the records for two installations that were considered faulty. These are discussed in **section 9**.

Audit commentary

AMS has a documented process in place for the management of seals and any subsequent investigation and reporting. There were no specific examples to examine where seals were broken but I examined the records for two installations that were considered faulty. These are discussed in **section 9**.

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) five business days for Category 3 or higher.*

Audit observation

I checked two examples where SmartCo had become aware of faulty metering installations because certification tests had failed. There were no other examples during the audit period.

Audit commentary

Two Category 2 metering installations failed their recertification tests. Traders were notified within 10 business days in both cases. These installations have had their certification cancelled as required, but recertification has not yet occurred. Both installations are under recording, one by 18% and the other by 32% since August 2018 and neither one has yet been recertified because SmartCo is waiting for the traders to organize shutdowns so the CTs can be replaced.

Audit outcome

Compliant

9.2. Testing of Faulty Metering Installations (Clause 10.44)

Code reference

Clause 10.44

Code related audit information

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

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

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

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

Audit observation

I checked two Category 2 ICPs where certification tests had failed.

Audit commentary

SmartCo was notified immediately that certification tests had failed, and the certification reports contained sufficient detail as required in a “statement of situation”. This information was passed on to the relevant traders immediately following notification by the ATH.

Audit outcome

Compliant

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

Code reference

Clause10.46(2)

Code related audit information

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

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

Audit observation

I checked two Category 2 ICPs where certification tests had failed.

Audit commentary

As mentioned above, the relevant detail required in a “statement of situation” was provided by the ATH and it was passed on to the relevant traders.

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

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 2 of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The MEP must within 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

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 3(5) of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

10.5. Electronic Interrogation of Metering Installations (Clause 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.

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

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

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

AMS as an agent conducts AMI data collection for SmartCo as an MEP, because data can only be accessed from their back office.

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

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

Audit commentary

The relevant parts of this clause are maximum interrogation cycle and storage of data. The other parts of the clause are discussed in other sections.

SmartCo provided reporting of ICPs where interrogation did not occur within the maximum interrogation cycle of 90 days. There are 372 “Active” ICPs in the report.

The Authority published a memo in July 2017 indicating their expectation that MEPs will manually read metering installations where the AMI flag is set to Y and where the automated interrogation fails. The expectation for investigation and updating the registry is as follows:

- where meters are interrogated daily, MEPs will trigger an investigation of repeated failures to communicate after no more than one week with no communication;
- where meters are not interrogated daily, MEPs will trigger an investigation of repeated failures to communicate after no more than three consecutive failed attempts, but within 31 days of the first communication failure;
- investigations should begin immediately and conclude within three business days even if a site visit is required, and if site access is not available and the meter is still not communicating, the meter should be designated as AMI= “N” until a site visit can be arranged; and
- if communications cannot be restored and the services access interface will not be the MEP’s back office system, the registry should be updated as soon as practicable after the investigation is completed, but within three business days.

The Authority intends to propose a Code change to clarify the timeframes for completing an investigation and updating the registry and will be using the above expectations as the basis for consultation on the proposed Code change.

SmartCo’s process is to commence investigation into non-communicating meters within three business days. If communications issues cannot be resolved, the AMI flag is changed to “N”. When data is continuous for 10 days, the flag is changed back to “Y”. Despite this process, there are still 372 ICPs not read within 90 days.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 10.5 With: Clause 8(2) of schedule 10.6 From: 01-May-18 To: 31-Mar-19	372 metering installations not read within the maximum interrogation cycle. Potential impact: Medium Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	Rationale for audit risk rating
Low	I have recorded the controls as moderate in this area because there is room to tighten the timeframes for resolution of these matters. The impact on settlement is recorded minor because of the low number involved; therefore, the audit risk rating for most retailers is low. For AMI only retailers, the impact would be greater and the audit risk rating higher. There was only one example for an AMI only retailer.

Actions taken to resolve the issue	Completion date	Remedial action status
The remaining metering installations are currently being reviewed to ensure the communications status is correct, where they are not communicating, they will be set to 'N'. We have already worked through a number of these and this number has reduced from the last audit. A clear timeframe has been set to ensure these are fully corrected within three months.	31 August 2019	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
The process for the correct flagging of the AMI communications flag has been tightened up recently, these metering installations are a remanence from the past and once cleaned up, there will not be another backlog.	31 August 2019	

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

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

Audit commentary

All data is provided to reconciliation participants via SFTP. Data is held indefinitely.

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

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

Audit commentary

AMS's server time is verified against an internet time source several times per day to ensure compliance with the requirement to ensure it is within ± 5 seconds.

Daylight saving adjustment occurs as follows:

Meter type	NZST Winter	NZDT Summer (Daylight savings)
EDMI DRR & Interval	Meters record in local time so files will always be midnight for DRR 23:59:59 and 12 to 12 for interval	Meters record in local time so files will always be midnight for DRR and 12 to 12 for interval
L&G DRR	Midnight read 23:59:59	L&G does not adjust to local time and stays on NZST. Therefore, meter cannot provide a midnight read in summer. Instead it provides an ad hoc register read, e.g. 9:45pm
L&G Interval	12am to 12pm intervals Files shows "N" across all L&G and EDM I as adjustment is not needed	L&G does not adjust to local time and stays on NZST. However, data is 'Adjusted' so are 1 to 1 but are adjusted to represent 12 to 12. File will show an "A"

The files sent to retailers contain a field indicating whether daylight saving has occurred.

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

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

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

Clock synchronisation is conducted every four hours as a distinct process, separate to interrogation. Any errors greater than ± 10 seconds but less than 20 minutes are automatically corrected and recorded. Errors greater than 20 minutes are recorded but not automatically corrected. The manual corrections are conducted by the software host, Silver Spring Networks, who then advise AMS that the changes have been made. This clause is slightly different to the clause in Part 15 for reconciliation participants. This clause requires MEPs to ensure the time is not outside the allowable thresholds, therefore non-compliance exists for those examples where time has drifted outside the allowable threshold.

I checked the most recent reports for each head end, and they contained a total of 381 examples.

There is also a requirement to notify the reconciliation participant of any “...affected raw meter data...” once clock corrections have occurred. This information is now provided in accordance with the Code.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 10.7 With: Clause 8(4) of Schedule 10.6 From: 01-May-18 To: 19-May-19	381 examples of clock errors outside the allowable thresholds. Potential impact: Medium Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as strong because clocks are synchronised during every successful interrogation. The impact is considered minor because most clock errors are small and are corrected within one half hour. The audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
The time sync process is fully automated and when the system detects a time drift over an internally set limit but within the allowable limits set out in Table 1 of clause 8(5) of Schedule 10.6, the system corrects it. Sometimes the drift exceeds the allowable limits, in this situation the system corrects the time and sends out an event file to the relevant retailer.		Ongoing	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
The system is designed to capture any drifts before they exceed the allowable limits and for the most part this is the case. Sometimes a meter will drift outside the allowable limits and is immediately corrected and the retailer informed. This process is 99.99% compliant.		Ongoing	

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

Code reference

Clause 8(7) of Schedule 10.6

Code related audit information

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

- a) *ensure an interrogation log is generated*

- b) *review the event log and:*
 - i. *take appropriate action*
 - ii. *pass the relevant entries to the reconciliation participant.*
- c) *ensure the log forms part of an audit trail which includes:*
 - i. *the date and*
 - ii. *time of the interrogation*
 - iii. *operator (where available)*
 - iv. *unique ID of the data storage device*
 - v. *any clock errors outside specified limits*
 - vi. *method of interrogation*
 - vii. *identifier of the reading device used (if applicable).*

Audit observation

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

Audit commentary

AMS downloads the event log as required by this clause. AMS provided a list of all 62 event types, which are downloaded during interrogation. Relevant events, including tampering, are now being placed on the SFTP server for each retailer to uplift and action. I checked that files were present for all of SmartCo's customers and I confirm compliance. Summary reporting is also provided.

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

I conducted a walkthrough of the event management process and I checked the most recent reporting.

Audit commentary

AMS has a "sum-check" process where the scalar interval metering data is compared to the scalar midnight snapshot. The scalar values take daylight savings into account where if the scalar midnight snapshot was compared to the interval data (always midnight to midnight) then there would be comparison problems during the daylight-saving period. If the difference is more than 0.1 kWh this is considered a "fail".

Each file sent to retailer's records whether the sum-check has failed (F), passed (P) or is not able to be checked due to missing intervals or missing midnight reads (N). SmartCo did not have specific details on the reasons for failures or remedial actions to reduce the number of failures. I recommend reasons for failures are investigated and resolved.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 8(9) of Schedule 10.6	Investigate reasons for sum-check failure and resolve contributing issues.	We are working with the retailer to investigate this sum check issue.	Investigating

The main issue leading to failure is when there is a power failure during an interval. This does not have an impact on data accuracy.

The other issue is with Landis + Gyr U3400 meters where a power outage can cause the clock to move to a random future time. This results in zeros in the interval data and a sum-check failure. The issue is remedied once real time catches up to the future time stamp. During the period of failure, the data is not provided to Retailers and they need to estimate. This occurs due to a firmware issue. A new firmware version has been provided and it is being tested prior to implementation. This issue has affected approx. 250 meters.

I examined SmartCo's current practices against the proposed Code changes in relation to sum-check. The proposed Code changes include the following key points:

1. Sum-check must pass (more than just having a process in place)
2. Sum-check pass threshold is 1 kWh
3. Register read and intervals must be for the same time period.

If these Code changes are made, SmartCo will have some issues with compliance, because approx. 25% of installations have a sum-check failure or there is insufficient data to conduct a sum-check, which would lead to cancellation of certification. There are also some meters not read at midnight, which are likely to fail sum-check validation.

Following the audit, a further issue was identified during a Retailer audit. It appears that during daylight saving adjustment in April 2019, at least 30,000 records for one Retailer had consumption in the second interval replaced with a zero. This does not achieve compliance with the requirement to provide complete and accurate information. This is recorded as non-compliance in **section 2.5**.

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

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

Audit commentary

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

Audit outcome

Not applicable

CONCLUSION

The audit identified 10 non-compliances and one recommendation is made.

Registry update timeliness continues to have a high level of compliance, with most of the late updates caused by late nomination by retailers. Whilst most registry fields are correct, there are a large number of ICPs with “IN24” recorded, which can lead to incorrect billing by retailers.

Three main issues were identified, and they contributed to four of the non-compliances, and 10 of the 19 future risk rating points. The three main points are as follows:

1. Two Category 2 metering installations were certified by Wells for two years, despite errors of 18% and 32%. Certification is cancelled, but recertification has not yet occurred. SmartCo is waiting for traders to arrange shutdowns so the CTs can be replaced.
2. 30 Category 2 installations were certified despite the burden being lower than the lowest test point. Certification is cancelled and the registry has not been updated.
3. Incomplete HHR data provided for 30,000 records during the change to NZST in April 2019. The 2nd interval was incorrectly recorded as zero.

I’ve recommended that the sum-check process be reviewed to ensure sum-check failures are investigated and contributing factors addressed. This may have helped with the NZST change issue mentioned above.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The table below provides some guidance on this matter and it recommends an audit frequency of 12 months. I agree with this recommendation.

PARTICIPANT RESPONSE

The results in the audit show a continued improvement across the board. Registry updates for new and updated connections are at their highest rates, 94% & 96% respectively, and these numbers would be much higher were it not for late nominations. Unfortunately, this had a detrimental effect on ICPs switched. Late nominations are still causing unnecessary effort and delays in the industry.