

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

For

INTELLIHUB

Prepared by: Steve Woods, Veritek Limited

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Date audit report completed: 30 October 2018

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EXECUTIVE SUMMARY

IntelliHUB is a Metering Equipment Provider (MEP) and is required to undergo an audit by 08 November 2018, in accordance with clause 1(1)(b) of schedule 10.5.

IntelliHUB uses customised systems already existing and used in the Australian market. The relevant systems are workflow, asset management and AMI data collection. The relevant systems interface with the registry.

This first full audit found four non-compliances. Two of the issues were minor and related to late registry updates. The most important issue is that agreements are not in place with Distributors regarding the design and functionality of metering installations. This matter needs to be resolved to ensure Distributors' requirements are met.

I've made three recommendations in relation to ATH practices and records. These matters have been raised with ATHs for several years now.

Controls are generally strong, and I consider the level of compliance to be high considering how new the processes are.

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 recommends an audit frequency of 12 months. The next audit frequency was discussed with IntelliHUB and it was agreed that a shorter period of 9 months may be more appropriate because in that time Category 2 and new connections processes will have commenced and a check of these after their introduction is considered prudent.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Distributor agreements	4.9	Clauses 10.34(2), (2A) and (3)	Agreements not in place with Distributors regarding design of metering installations.	None	Low	5	Investigating
Registry updates	4.10	Clause 3 of Schedule 11.4	Some backdated corrections.	Strong	Low	1	Identified
MEP acceptance	6.1	Clause 1(1) of Schedule 11.4	One late acceptance.	Strong	Low	1	Cleared
Registry validation	6.3	6 of Schedule 11.4	Complete registry validation not conducted.	None	Low	5	Investigating
Future Risk Rating						12	

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

RECOMMENDATIONS

Subject	Section	Clause	Description
Design and accuracy	4.3	4(1) of Schedule 10.7	Ensure ATHs uncertainty calculation processes are compliant and documentation is accurate before issuing Category 2 recertification work.
Accurate and complete records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	Ensure ATHs improve the clarity within their Category 2 certification reports, as recommended in their ATH audit reports.
Burden	7.5	30(1) and 31(2) of Schedule 10.7	Ensure ATHs are adding burden using good industry practice and they are not compromising compliance with any other clauses.

ISSUES

Subject	Section	Recommendation	Description

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

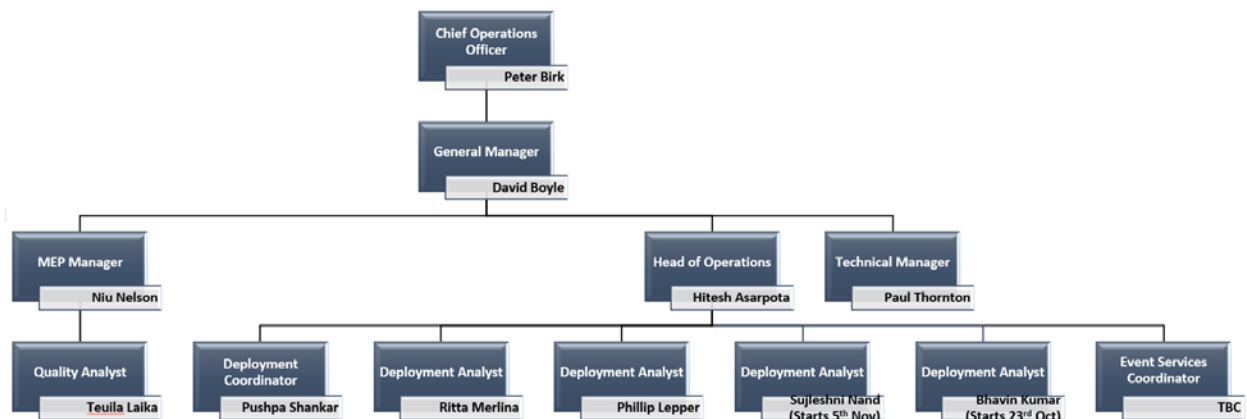
I checked the Electricity Authority website and I confirm there are no exemptions in place.

Audit commentary

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

1.2. Structure of Organisation

IntelliHUB's organisation structure is shown below.



1.3. Persons involved in this audit

Auditor: Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

IntelliHUB personnel assisting in this audit were:

Name	Title
David Boyle	General Manager
Niu Nelson	MEP Manager
Hitesh Asarpota	Head of Operations
Paul Thornton	Technical Manager
Teuila Laika	Quality Analyst
Pushpa Shankar	Deployment Coordinator

1.4. Use of Agents (Clause 10.3)

Code reference

Clause 10.3

Code related audit information

A participant who uses a contractor

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

Audit observation

I checked whether there were any agents or contractors involved in the performance of functions within the scope of the audit.

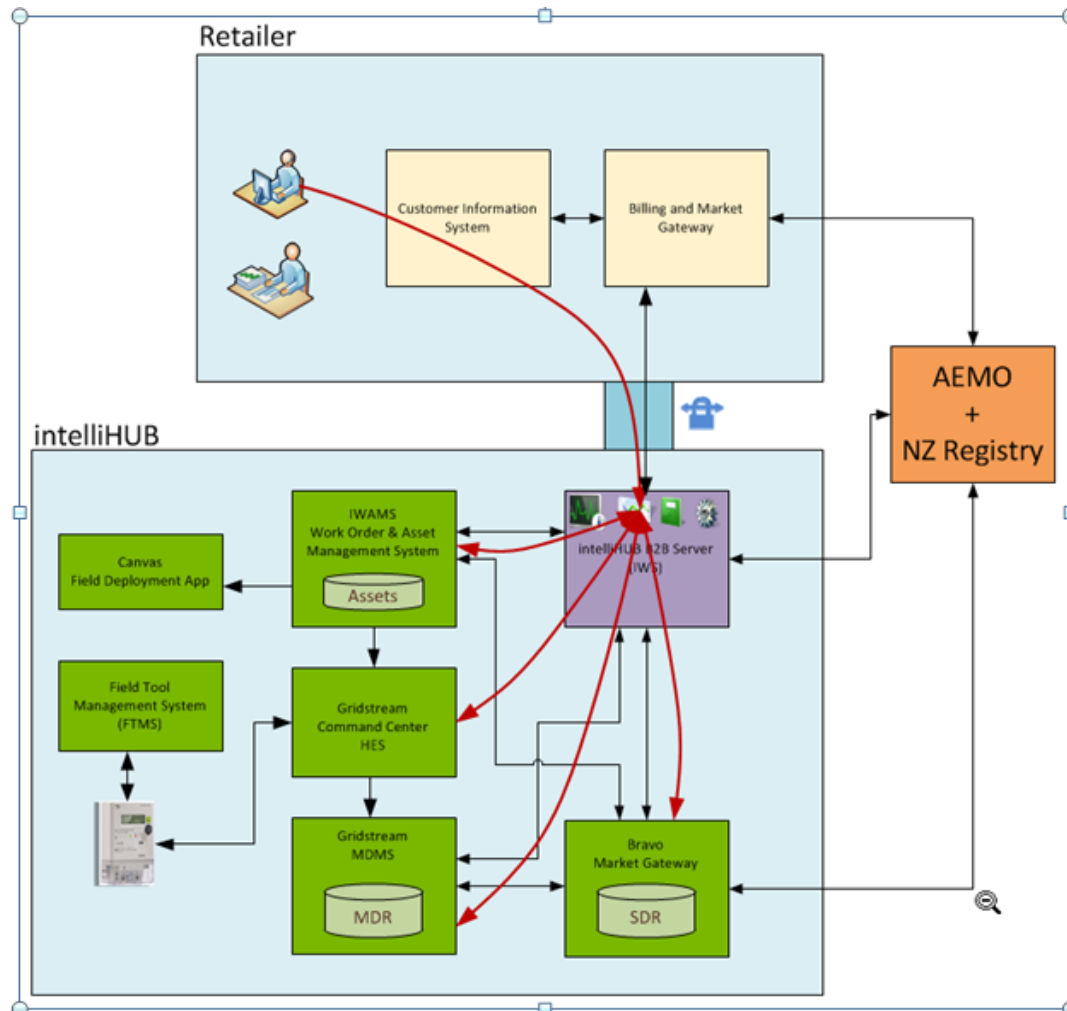
Audit commentary

IntelliHUB engages ATHs to conduct certification activities. The issue of storage of certification records was discussed because many MEPs use ATHs to store these records. IntelliHUB intends to keep records themselves rather than outsource this activity. Compliance is more difficult to achieve if this is outsourced.

1.5. Hardware and Software

I checked whether there were any systems used in the performance of functions relevant to the scope of the audit.

The relevant systems are shown in the diagram below.



Backup and security is in accordance with standard industry protocols.

1.6. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of the audit.

1.7. ICP Data

The table below shows active ICPs at 03/10/18.

Metering Category	Number of ICPs
1	1,534
2	1
3	0
4	0
5	0
9	0

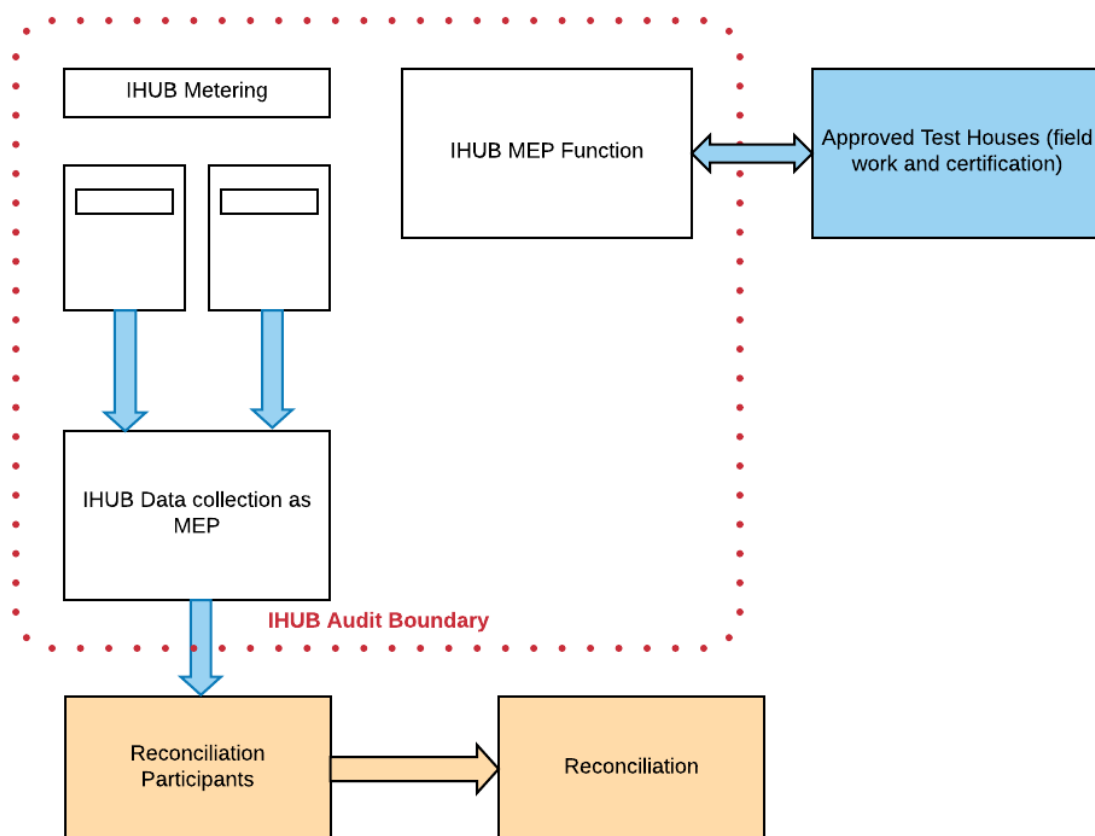
1.8. Authorisation Received

A letter of authorisation was not required.

1.9. Scope of Audit

This audit was conducted in accordance with the Guideline for Metering Equipment Provider Audits V2.1, which was published by the Electricity Authority.

The diagram below shows the audit boundary.



1.10. Summary of previous audit

The previous audit was conducted by Steve Woods of Veritek in May 2018. Six recommendations were made, which are listed below.

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			Nil				

RECOMMENDATIONS

Subject	Section	Clause	Description	Status
Payment of costs to losing MEP	3.1	10.22	Obtain an official assurance in writing from the Authority that this clause does not apply to IntelliHUB if they replace another MEP's metering and become the MEP.	Cleared
Design and accuracy	4.3	4(1) of Schedule 10.7	Ensure ATHs uncertainty calculation processes are compliant before issuing Category 2 recertification work.	Identified
Change of design	4.9	10.34(2), (2A) and (3)	Seek written confirmation from Distributors regarding Metering Installation design	Not adopted
Accurate and complete records	5.1	4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	Ensure Delta and Wells ATHs improve the clarity within their certification reports, as recommended in their ATH audit reports.	Cleared
Accuracy of registry records	6.2	7 (1), (2) and (3) of Schedule 11.4	<p>Prepare information on valid register content codes per network so that incorrect codes are identified immediately and prior to the registry being populated.</p> <p>Identify and flag installations with compensation factors of 3 to ensure they are managed in a compliant manner.</p> <p>Run the MEP audit tool monthly for at least the first 3 months to ensure data accuracy.</p>	Cleared
Certification tests	7.2	10.38(b) and clause 9 of Schedule 10.6	Conduct a technical review of all Category 2 metering installation certification records to ensure compliant practices are employed and that data is correct	Will be adopted

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

I checked the location of the services access interface and how this is recorded for AMI metering.

Audit commentary

The services access interface is located remotely for AMI metering and is recorded in the metering installation certification reports by the ATH. The workflow system contains a field for recording the services access interface.

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 in relation to this audit.

Audit commentary

IntelliHUB 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

IntelliHUB uses the IHUB code for all information.

Audit commentary

IntelliHUB uses the IHUB code for all information.

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

I checked that the ATHs have a process to check the relevant type test certificates to ensure compliance with this clause.

Audit commentary

IntelliHUB ensures all communication equipment is appropriately certified with the relevant telecommunications standards. This is recorded in type test certificates and other approval documents.

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

I checked the registry and workflow validation processes and the registry metering records in the PR255 report.

Audit commentary

IntelliHUB has a suite of validation reports to ensure compulsory fields are populated and that there are no errors within the data. Registry accuracy was found to be of a high standard and I consider compliance has been achieved with the requirement to take all practicable steps to ensure information accuracy.

Audit outcome

Compliant

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

This clause was discussed during the audit and it has been discussed at an industry level.

Audit commentary

The clause does not have any conditions and states: “*The gaining MEP must pay the losing MEP a proportion of the costs within 20 business days of assuming responsibility*”. If the industry uses this clause as it is written, there could be a risk for IntelliHUB that they could receive invoices from losing MEPs.

IntelliHUB has a written assurance from the Authority that they won’t have to pay any invoices they receive if the losing MEP’s components are removed.

IntelliHUB has not received any invoices from losing MEPs.

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 report for the audit period to ensure updates were within 15 business days.

Audit commentary

The table below shows that all updates were within 15 business days.

Year	ICPs Switched	Notified to registry within 15 days	Percentage compliant	Average days
2018	1,306	1,306	100%	0

Audit outcome

Compliant

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

Code reference

Clause 5 of Schedule 10.6

Code related audit information

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

On receipt of a request from the gaining MEP, the losing MEP has 10 business days to provide the gaining MEP with the metering records or the facilities to enable the gaining MEP to access the metering records.

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

Audit observation

IntelliHUB confirmed metering records will be provided as required. No requests have been made.

Audit commentary

IntelliHUB confirmed metering records will be provided as required.

Audit outcome

Compliant

3.4. Termination of MEP Responsibility (Clause 10.23)

Code reference

Clause 10.23

Code related audit information

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

The MEP is responsible if it:

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

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

An 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

IntelliHUB intends to retain records indefinitely.

Audit commentary

IntelliHUB intends to retain records indefinitely. They have ceased to be responsible for one metering installation and they were able to demonstrate that the records were still available.

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

IntelliHUB now have their own design reports, which I checked during the audit.

Audit commentary

The design reports were reviewed and confirmed as compliant.

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

IntelliHUB has used Wells and Trustpower ATHs and both have appropriate scopes of approval. It is intended that Delta will also be used in future and they also have an appropriate scope of approval.

Audit commentary

IntelliHUB has used Wells and Trustpower ATHs and both have appropriate scopes of approval.

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 that the design will ensure errors stipulated in Table 1 will not be exceeded.

I also checked the compliance of ATHs in relation to this clause.

Audit commentary

The design report (including configuration scheme) confirms the errors stipulated in Table 1 will not be exceeded. The data from the devices contain three decimal places.

Delta and Wells have had a history of non-compliance in relation to this clause, specifically where Category 2 comparative certification is conducted, and uncertainty calculations do not consider all relevant sources of error.

Delta has previously disputed the need to consider temperature in their calculations, despite the Code requiring error calculations to include “all sources of measurement error”.

As recorded in the previous audit report, the Wells certification reports do not clearly state the overall installation error and the overall uncertainty. This is raised as a recommendation in **section 5.1**. Compliance is recorded because the calculations occur correctly. The relevant part of a metering installation certification report is shown below, and it can be explained as follows:

- The “Tolerance” field is calculated by taking the maximum permitted error (2.5%) minus the maximum permitted uncertainty (0.6%) minus the working standard (including clamps) error. In the example below this is 2.5 minus 0.6 minus 0.314 = 1.586. This is used by Wells as the maximum allowable error for the comparative test, excluding consideration of temperature. The tolerance is conservative because the Code allows 2.5% as the maximum error so the tolerance could be 2.5 minus 0.314, but I support the use of conservative figures because 2.5% is generous considering most meters are Class 1 and most CT sets are Class 0.5.
- The next step in the calculation occurs following the comparative test and uses the tested error (difference between working standard kWh and kWh recorded by the meter) adjusted by the temperature coefficient of 0.03% per degree Celsius. The installation error can be derived by adding the “VALIDATION CHECK” to the tolerance, which gives a result of + 0.536% (0.54% rounded to two decimals), which is recorded below as “Pre Post Read Result Value”.

It would be preferable if the results were recorded as follows:

Total allowable error – 2.5%

Measured error - 0.54% (including uncertainty due to temperature)

Working standard uncertainty – 0.314%

Better still would be to record the measured error and include temperature uncertainty in with the working standard uncertainty.

Prevailing Load Test 1

Completed: 05 Mar 2018 13:46

Multiplier	1
Hioki Asset No	Set 7 - 500A
Tolerance	1.586
Hioki Connected Photo	YES
Pre Test Read	27
Temperature	27
Post Test Read	31
Seconds	979.2
Equip Reading	3.977
VALIDATION CHECK (must be negative)	-1.05
Pre Post Read Result Value	0.54

IntelliHUB is required to ensure compliant processes are used, therefore I recommend they ensure ATH processes are compliant, and documentation is accurate prior to the issue of any Category 2 comparative recertification jobs.

Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 4(1) of Schedule 10.7	Ensure ATHs uncertainty calculation processes are compliant and documentation is accurate before issuing Category 2 recertification work.	Intellihub are working with ATH's prior to commencement of Category 2 deployment to ensure compliance and will take note of the auditor's recommendations.	Investigating

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

IntelliHUB will not deal with higher category metering and it's unlikely they will deal with any installations with subtraction.

Audit commentary

IntelliHUB will not deal with higher category metering and it's unlikely they will deal with any installations with subtraction. None were identified.

Audit outcome

Not applicable

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

IntelliHUB will not deal with higher category metering.

Audit commentary

IntelliHUB will not deal with higher category metering. None were identified during the audit.

Audit outcome

Not applicable

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

Code reference

Clause 4(3) of Schedule 10.7

Code related audit information

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

Audit observation

IntelliHUB will not deal with NSP metering.

Audit commentary

IntelliHUB will not deal with NSP metering.

Audit outcome

Not applicable

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

IntelliHUB will not deal with Grid metering.

Audit commentary

IntelliHUB will not deal with 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

Wells, Trustpower and Delta all have compliant practices in relation to this clause, which results in compliance for IntelliHUB.

Audit commentary

Wells, Trustpower and Delta all have compliant practices in relation to this clause, which results in compliance for IntelliHUB.

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

The installation of AMI constitutes a change in design. I checked that consultation had occurred and agreement reached with relevant distributors and traders.

Certification has occurred for the following traders:

- Trustpower

Certification has occurred on the following networks:

- Alpine
- Wellington
- Marlborough Lines
- Powerco.

Audit commentary

IntelliHUB has only provided services to Trustpower and agreement has been reached. Agreements are not in place with Distributors mentioned above. These agreements will need to be in place to achieve compliance with this clause.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 4.9 With: Clauses 10.34(2), (2A) and (3) From: 08-Aug-18 To: 17-Oct-18	Agreements not in place with Distributors regarding design of metering installations. Potential impact: Medium Actual impact: Low Audit history: None Controls: None Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
Low	Whilst discussions have been had, there isn't a step in place to require agreement prior to becoming the MEP on any given Network. There doesn't appear to be any impact on Distributors, but this won't be known until negotiations commence. The audit risk rating is recorded as low.		
Actions taken to resolve the issue		Completion date	Remedial action status
IntelliHub have commenced conversations with Distributors and have emailed design reports, dated 16/10/2018. We will use best endeavors to seek written confirmation.		16/10/2018	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
IntelliHub will continue to have conversations and email design reports prior to the roll out of deployment in future Networks. We will use best endeavors to seek written confirmation.		31/07/2020	

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 examined the event detail report for the audit period to determine compliance.

Audit commentary

The ten-day threshold was met for all "business as usual" updates. The metering installation certification number was changed for 370 ICPs and these were backdated corrections. No new connections were dealt with by IntelliHUB. The table below summarises compliance.

Event type	Year	Total	Total within 10 days	% Compliant	Average days
Correction/change	2018	370	94	25%	16
New connection	2018	0	N/A	N/A	N/A
Re-certification	2018	514	514	100%	2

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 4.10 With: Clause 3 of Schedule 11.4 From: 01-Sep-18 To: 04-Oct-18	Some backdated corrections. Potential impact: Low Actual impact: None Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as strong because all “BAU” updates are well managed and were on-time. The late updates were corrections found during validation. There was no impact on other participants or on settlement; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Exceptions found during validation checks and agreed with Participants that a bulk update will occur once on 23/09/2018 to resolve the discrepancies.		23/09/2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
An enhancement release into production to cater for the current exceptions found during validation checks.		31/10/2018	

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

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

Audit commentary

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

Audit outcome

Compliant

4.12. Responsibility for Metering at ICP (Clause 11.18B(3))

Code reference

Clause 11.18B(3)

Code related audit information

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

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

Audit observation

All of IntelliHUB’s meters are AMI; therefore, they are responsible for interrogation and they provide daily reads to comply with this clause.

Audit commentary

All of IntelliHUB’s meters are AMI; therefore, they are responsible for interrogation and they provide daily reads to comply with this clause.

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

It is unlikely that IntelliHUB will be required to approve and burden changes. This is normally limited to HV installations.

Audit commentary

It is unlikely that IntelliHUB will be required to approve and burden changes. This is normally limited to HV installations.

Audit outcome

Not applicable

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

Software, ROM or firmware changes are likely to occur in the future and the Landis + Gyr test laboratory is likely to provide the new versions and the instructions to implement.

Audit commentary

Software, ROM or firmware changes are likely to occur in the future and the Landis + Gyr test laboratory is likely to provide the new versions and the instructions to implement.

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

IntelliHUB will mostly be engaged in meter replacement in the short term. New connections will be conducted at some point in the future and appropriate processes will be developed, including the management of temporary energisation.

Audit commentary

IntelliHUB will mostly be engaged in meter replacement in the short term. New connections will be conducted at some point in the future and appropriate processes will be developed, including the management of temporary energisation.

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 the Trustpower and Wells certification records to confirm compliance. It is intended that Delta will be used in future.

Audit commentary

The Trustpower and Wells certification records are compliant. In the previous report I recommended IntelliHUB require Wells to improve the clarity of their certification and calibration reports. The Category 1 reports are now clearer than they were, and field descriptions now make information easier to understand.

Category 2 certification records have not yet been dealt with and I recommend IntelliHUB obtains copies of these from all ATHs to ensure compliance and clarity.

Audit outcome

Compliant

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 4(1)(a) and (b) of Schedule 10.6, and Table 1, Schedule 11.4	Ensure ATHs improve the clarity within their Category 2 certification reports, as recommended in their ATH audit reports.	Intellihub will work with ATH's to ensure compliance and clarity of paperwork for Category 2.	Identified

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

IntelliHUB will not need to conduct inspections for seven years.

Audit commentary

IntelliHUB will not need to conduct inspections for seven years.

Audit outcome

Not applicable

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

IntelliHUB intends to keep records indefinitely.

Audit commentary

IntelliHUB intends to keep records indefinitely.

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

IntelliHUB will supply records as required. There were no examples to examine.

Audit commentary

IntelliHUB will supply records as required. There were no examples to examine.

Audit outcome

Compliant

6. MAINTENANCE OF REGISTRY INFORMATION

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

Code reference

Clause 1(1) of Schedule 11.4

Code related audit information

Within 10 business days of being advised by the registry that it is the gaining MEP for the metering installation for the ICP, the MEP must enter into an arrangement with the trader and advise the registry it accepts responsibility for the ICP and of the proposed date on which it will assume responsibility.

Audit observation

I checked the event detail report for the period 01/08/18 to 01/10/18 to check for any late acceptances.

Audit commentary

One nomination was accepted late. This was due to an acceptance file being generated and queued for Registry update but not monitored to ensure the automated file was sent.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.1 With: Clause 1(1) of Schedule 11.4 From: 10-Sep-18 To: 17-Sep-18	One late acceptance. Potential impact: Low Actual impact: None Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as strong because they now ensure all nominations are accepted within 10 business days. There was no impact on any other party; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Intellihub automation will accept nominations and will ensure the MN switch breach table is monitored daily. Intellihub enhancement released to ensure .ack files are received when an MN file is triggered.		17/09/2018	Cleared
Preventative actions taken to ensure no further issues will occur		Completion date	
Intellihub automation will accept nominations and will ensure the MN switch breach table is monitored daily. Intellihub enhancement released to ensure .ack files are received when an MN file is triggered.		17/09/2018	

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

Registry updates are automated.

I checked all records to identify potential errors.

I checked how the AMI communicating/non-communicating field is intended to be managed.

Audit commentary

With regard to the AMI communicating/non-communicating field, if communication does not occur for 10 days a site visit is arranged. If this is not resolved by the 14th day, the registry is changed to AMI non-communicating. There were three examples where this had occurred.

Register content codes and periods of availability are fields which can become inaccurate if they are not closely managed. During the previous audit, I recommended IntelliHUB prepares information on valid register content codes per network so that incorrect codes are identified immediately and prior to the registry being populated. This recommendation was adopted.

I also recommended IntelliHUB identifies installations with compensation factors of three (single phase meter on three phase installation) to ensure these are correctly managed. This recommendation was also adopted.

IntelliHUB has a suite of validations and they are also regularly running the MEP audit tool (access database built to identify discrepancies within data) to ensure data accuracy.

I did not identify any data errors.

Audit outcome

Compliant

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 checked the data validation processes and results to ensure compliance.

Audit commentary

IntelliHUB has sound validation controls in place to identify data errors, but they are not conducting a complete validation against registry data as required by this clause.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.3 With: Clause 6 of Schedule 11.4 From: 08-Aug-18 To: 17-Oct-18	Complete registry validation not conducted. Potential impact: Low Actual impact: Low Audit history: None Controls: None Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
Low	The controls for data validation in general are strong but this specific check is not conducted as required by the Code. Errors were not identified by the other checks conducted, therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
IntelliHub run the MEP audit access database weekly to identify discrepancies and are working towards monthly reconciliation against the Registry and IntelliHub records.		21/01/2019	Investigating

Preventative actions taken to ensure no further issues will occur	Completion date	
Intellihub run the MEP audit access database weekly to identify discrepancies and are working towards monthly reconciliation against the Registry and Intellihub records.	21/01/2019	

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

Code reference

Clause 20 of Schedule 10.7

Code related audit information

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

- a) the metering installation is modified otherwise than under sub clause 19(3) or 19(6)*
- b) the metering installation is classed as outside the applicable accuracy tolerances set out in Table 1 of Schedule 10.1, defective or not fit for purpose under this Part or any audit*
- c) an ATH advises the metering equipment provider responsible for the metering installation of a reference standard or working standard used to certify the metering installation not being compliant with this Part at the time it was used to certify the metering installation, or the failure of a group of meters in the statistical sampling recertification process for the metering installation, or the failure of a certification test for the metering installation*
- d) the manufacturer of a metering component in the metering installation determines that the metering component does not comply with the standards to which the metering component was tested*
- e) an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part*
- f) if the metering installation has been determined to be a lower category under clause 6 and the maximum current conveyed through the metering installation at any time exceeds the current rating of its metering installation category as set out in Table 1 of Schedule 10.1*
- g) the metering installation is certified under clause 14 and sufficient load is available for full certification testing and has not been retested under clause 14(4)*
- h) a control device in the metering installation certification is, and remains for a period of at least 10 business days, bridged out under clause 35(1)*
- i) the metering equipment provider responsible for the metering installation is advised by an ATH under clause 48(6)(b) that a seal has been removed or broken and the accuracy and continued integrity of the metering installation has been affected.*

A metering equipment provider must, within 10 business days of becoming aware that one of the events above has occurred in relation to a metering installation for which it is responsible, update the metering installation's certification expiry date in the registry.

Audit observation

I checked all the points above to determine whether certification was cancelled for any installations.

Audit commentary

There were no examples of cancelled certification.

Audit outcome

Compliant

6.5. Registry Metering Records (Clause 11.8A)

Code reference

Clause 11.8A

Code related audit information

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

Audit observation

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 IntelliHUB 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 IntelliHUB 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 checked the PR255 report to ensure all ICPs had current certification.

Audit commentary

All ICPs have current certification.

Audit outcome

Compliant

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 IntelliHUB's approach to compliance with this clause.

Audit commentary

IntelliHUB intends to review ATH audit reports to ensure compliance with this clause. During the previous audit, I recommended they also conduct a technical review of each certification report, including commissioning details, to ensure compliant practices are used and that information is correct. IntelliHUB intends to adopt this recommendation.

IntelliHUB has commenced an audit program of ATH activities. ATHs are required to audit 3% of all installations and IntelliHUB has commenced auditing a further 2%. The audit program also includes "live" audits whilst the work is being conducted. The audit results are generally positive and confirm safety and compliance.

IntelliHUB has ensured meters have a decimal point so that load tests and register advance tests can be conducted efficiently.

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 type test reports to confirm compliance.

Audit commentary

Type test reports confirm compliance.

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

It is unlikely that burden will change for any Category 2 metering installations. I took the opportunity to discuss the matter of low burden as part of this section.

Audit commentary

The matter of low burden was discussed. I recommended to IntelliHUB during the previous audit that they ensure ATHs consider burden when they are certifying Category 2 metering installations. Delta and Wells are both compliant with this clause, but I have a further recommendation which is that IntelliHUB checks the practices used to ensure they are consistent with good industry practice and that the integrity of the test facility is not compromised. It has recently come to my attention that ATHs may be removing one of the test facility terminals to install burden resistors, which means the test facility cannot be used to test current and is therefore not compliant.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 30(1) and 31(2) of Schedule 10.7	Ensure ATHs are adding burden using good industry practice and they are not compromising compliance with any other clauses.	IntelliHub are working with ATH's prior to commencement of Category 2 and will take note of the auditor's recommendations.	Investigating

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

If a meter is certified in this manner:

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

Audit observation

I checked IntelliHUB's intended approach to compliance with this clause.

Audit commentary

IntelliHUB intends to conduct a technical review of all Category 2 certification records and this will include a check that the protection rating is recorded.

Where the protection rating is higher than 500A, IntelliHUB intends to monitor the demand.

There were no examples of ICPs certified as a lower category.

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 IntelliHUB's intended approach to compliance with this clause.

Audit commentary

IntelliHUB intends to conduct a technical review of all Category 2 certification records and this will include a check that the appropriate processes have been followed. It is intended that ATHs will carry sufficient load to carry out certification testing at the time of certification.

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 1 business day:*
- *the MEP must follow the procedure for handling faulty metering installations (clause 10.43 - 10.48).*

Audit observation

I checked IntelliHUB's intended approach to compliance with this clause.

Audit commentary

IntelliHUB intends to conduct a technical review of all Category 2 certification records and this will include a check that the appropriate processes have been followed. It is intended that ATHs will carry sufficient load to carry out certification testing at the time of certification.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

- *advise the market administrator, by no later than 10 business days after the date of certification of the metering installation, of the details in clause 32(2)(a) of Schedule 10.7*
- *respond, within 5 business days, to any requests from the market administrator for additional information*
- *ensure that all of the details are recorded in the metering installation certification report*
- *take all steps to ensure that the metering installation is certified before the certification expiry date.*

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

Audit observation

IntelliHUB does not intend to apply alternative certification.

Audit commentary

IntelliHUB does not intend to apply alternative certification. There were no examples of this occurring.

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

There will not be any metering installations with timeclocks relevant to this clause.

Audit commentary

There will not be any metering installations with timeclocks relevant to this clause.

Audit outcome

Not applicable

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

Code reference

Clause 35 of Schedule 10.7

Code related audit information

The participant must, within 10 business days of bridging out a control device or becoming aware of a control device being bridged out, notify the following parties:

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

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

Audit observation

IntelliHUB provided process documentation which is compliant with this clause. I also checked some recent examples of bridged relays.

Audit commentary

IntelliHUB provided process documentation which is compliant with this clause.

I checked two recent examples and the notification occurred within 10 business days.

The control function in the integrated control devices can revert to a pre-programmed timetable, so if the control device does not receive a signal it continues to operate to the program. This should eliminate the need to bridge control devices for IntelliHUB devices. If the device reverts to the timetable this is recorded as an “event”.

Audit outcome

Compliant

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

Code reference

Clause 34(5) of Schedule 10.7

Code related audit information

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

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

Audit observation

I checked whether any notification had been provided.

Audit commentary

IntelliHUB has not received notification in relation to this clause.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

Audit observation

Statistical sampling will not be required for the next 15 years.

Audit commentary

Statistical sampling will not be required for the next 15 years.

Audit outcome

Not applicable

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

Code reference

Clause 24(3) of Schedule 10.7

Code related audit information

If a compensation factor must be applied to a metering installation that is an NSP, the MEP must advise the reconciliation participant responsible for the metering installation of the compensation factor within 10 days of certification of the installation.

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

Audit observation

IntelliHUB demonstrated the automated registry loading process and the file format includes the compensation factor.

Audit commentary

IntelliHUB demonstrated the automated registry loading process and the file format includes the compensation factor.

IntelliHUB also intends to conduct a technical review of all Category 2 certification records to ensure compensation factors are correct.

Audit outcome

Compliant

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

Code reference

Clause 26(1) of Schedule 10.7

Code related audit information

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

Audit observation

I checked the certification records for 20 metering installations to confirm compliance.

Audit commentary

All meters were certified in accordance with this clause.

Audit outcome

Compliant

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

Code reference

Clause 28(1) of Schedule 10.7

Code related audit information

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

Audit observation

I checked IntelliHUB's intended approach to CT certification.

Audit commentary

IntelliHUB intends to purchase pre-certified CTs from TWS for any installations where CTs need to be installed or replaced.

Audit outcome

Compliant

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

Code reference

Clause 36(1) of Schedule 10.7

Code related audit information

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

Audit observation

I checked the certification records for 20 metering installations to confirm compliance.

Audit commentary

All data storage devices were certified in accordance with this clause.

Audit outcome

Compliant

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

Code reference

Clause 7 (3) Schedule 10.3

Code related audit information

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

Audit observation

IntelliHUB is aware of this clause and will monitor the ATH approval details on the website.

Audit commentary

IntelliHUB is aware of this clause and will monitor the ATH approval details on the website. All relevant ATHs have current approval.

Audit outcome

Compliant

7.19. Interim Certification (Clause 18 of Schedule 10.7)

Code reference

Clause 18 of Schedule 10.7

Code related audit information

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

Audit observation

This clause is not relevant to IntelliHUB.

Audit commentary

This clause is not relevant to IntelliHUB.

Audit outcome

Not applicable

8. INSPECTION OF METERING INSTALLATIONS

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

Code reference

Clause 45 of Schedule 10.7

Code related audit information

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

- *have been inspected by an ATH within 120 months from the date of the metering installation's most recent certification or*
- *for each 12-month period, commencing 1 January and ending 31 December, a sample of the category 1 metering installations selected under clause 45(2) of Schedule 10.7 has been inspected by an ATH.*

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

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

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

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

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

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

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

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

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

Audit observation

Inspections will not be required for many years.

Audit commentary

Inspections will not be required for many years.

Audit outcome

Not applicable

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

Code reference

Clause 46(1) of Schedule 10.7

Code related audit information

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

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

Audit observation

Inspections will not be required for many years.

Audit commentary

Inspections will not be required for many years.

Audit outcome

Not applicable

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

Code reference

Clause 44(5) of Schedule 10.7

Code related audit information

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

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

Audit observation

Inspections will not be required for many years.

Audit commentary

Inspections will not be required for many years.

Audit outcome

Not applicable

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

Code reference

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

Code related audit information

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

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

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

The MEP must make the above arrangements within:

- a) 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

IntelliHUB provided process documentation which is compliant with this clause.

Audit commentary

IntelliHUB provided process documentation which is compliant with this clause. There were no examples to examine.

Audit outcome

Compliant

9. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

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

Code reference

Clause 10.43(4) and (5)

Code related audit information

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

- a) 20 business days for Category 1,*
- b) 10 business days for Category 2 and*
- c) 5 business days for Category 3 or higher.*

Audit observation

IntelliHUB provided process documentation which is compliant with this clause.

Audit commentary

IntelliHUB provided process documentation which is compliant with this clause. There were no examples to examine.

Audit outcome

Compliant

9.2. Testing of Faulty Metering Installations (Clause 10.44)

Code reference

Clause 10.44

Code related audit information

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

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

- a) test the metering installation*
- b) provide the MEP with a statement of situation within 5 business days of:*
- c) becoming aware that the metering installation may be inaccurate, defective or not fit for purpose; or*
- d) reaching an agreement with the participant.*

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

Audit observation

IntelliHUB provided process documentation which is compliant with this clause.

Audit commentary

IntelliHUB provided process documentation which is compliant with this clause. There were no examples to examine.

Audit outcome

Not applicable

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

Code reference

Clause 10.46(2)

Code related audit information

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

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

Audit observation

IntelliHUB provided process documentation which is compliant with this clause.

Audit commentary

IntelliHUB provided process documentation which is compliant with this clause. There were no examples to examine.

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

IntelliHUB will provide data as required by this clause.

Audit commentary

IntelliHUB will provide data as required by this clause. There were no examples of data requests.

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

IntelliHUB will provide data in compliance with this clause.

Audit commentary

IntelliHUB will provide data as required by this clause. There were no examples of data requests.

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

IntelliHUB will provide access as required.

Audit commentary

IntelliHUB will provide access as required. There were no examples of requests for access to metering installations.

Audit outcome

Compliant

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

Code reference

Clause 3(5) of Schedule 10.6

Code related audit information

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

Audit observation

IntelliHUB will provide access as required.

Audit commentary

IntelliHUB will provide access as required. There were no examples of requests for access to metering installations.

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

I conducted a walkthrough of the data collection and provision process and system via a skype call to IntelliHUB in Australia to confirm compliance with the Code.

Audit commentary

The following findings are relevant to compliance with these clauses.

- The maximum interrogation cycle is 60 days. Interrogation occurs four times per day and the registry is changed to "AMI non-communicating" after 14 days if data is not successfully obtained, therefore compliance is achieved with the requirement to "interrogate" within 60 days. A relevant point to note is that "interrogation" does not occur in the traditional sense. The devices are programmed to "push" data to the head end.

- The clock synchronisation setting is 5 seconds to 10 seconds. Any clock errors between these times are adjusted automatically. Any errors outside these times are adjusted by a separate schedule. Clock errors over 10 seconds are reported to retailers. The reporting was demonstrated.
- The event log download process was demonstrated, and I confirmed the event log contains the appropriate events to achieve compliance. The event information is transferred via SFTP and is in a format agreed with retailers. A list was provided with 84 individual events and a selection of these have been deemed relevant and are reported to retailers. The relevant events can be summarised as follows:
 - tamper (initially filtered by IntelliHUB to remove false records)
 - phase failure
 - memory failure
 - temperature alarm
 - reverse power (detecting unexpected generation flow)
 - load side voltage detection (to detect bridging of remotely disconnected devices)
 - clock synchronisation
 - time synchronisation failure (because outside the threshold)
 - re-programming
 - manual download.
- Data will be kept for at least 48 months.
- Data is transmitted securely by SFTP and is only accessible to authorised persons with appropriate passwords.
- The interrogation log contains all relevant details as required by the Code.

Audit outcome

Compliant

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

Code reference

Clause 10.15(2)

Code related audit information

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

Audit observation

I conducted a walkthrough of the data security processes.

Audit commentary

Data is transmitted securely by SFTP and is only accessible to authorised persons with appropriate passwords.

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 data collection and provision process and system via a skype call to IntelliHUB in Australia to confirm compliance with the Code.

Audit commentary

The clock synchronisation setting is 5 seconds to 10 seconds.

Any clock errors between these times are adjusted automatically. Any errors outside these times are adjusted by a separate schedule. Clock errors over 10 seconds are reported to retailers.

Time synchronisation will not occur automatically across the boundary of a trading period. This is to ensure all time changes occur within a trading period, so data is not lost. For example, if the data storage device time is 13:01:20 and the device is “fast” by 100 seconds (a very unlikely occurrence) the time will not be changed back to 12:59:50 because if it was the kWh from 13:00:00 to 13:01:20 would be lost. Any time changes over a boundary must be made manually and normal practice is to conduct the change within the trading period.

Audit outcome

Compliant

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 data collection and provision process and system via a skype call to IntelliHUB in Australia to confirm compliance with the Code.

Audit commentary

- The event log download process was demonstrated, and I confirmed the event log contains the appropriate events to achieve compliance. The event information is transferred via SFTP and is in a format agreed with retailers. The relevant events can be summarised as follows:
 - tamper (initially filtered by IntelliHUB to remove false records)
 - phase failure
 - memory failure
 - temperature alarm
 - reverse power (detecting unexpected generation flow)
 - load side voltage detection (to detect bridging of remotely disconnected devices)
 - clock synchronisation
 - time synchronisation failure (because outside the threshold)
 - re-programming
 - manual download.

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 data collection and provision process and system via a skype call to IntelliHUB in Australia to confirm compliance with the Code.

Audit commentary

Sum-check validation occurs daily and is based on midnight to midnight NZST. The "fail" setting is 1 kWh and all trading periods must be present for a pass to occur. Any failures are investigated to determine the cause. One example was present from the previous day, it was likely to be a comms issue leading to some missing intervals. The investigation was not complete to confirm this, but the processes were confirmed to be robust.

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

I conducted a walkthrough of the data collection and provision process and system via a skype call to IntelliHUB in Australia to confirm compliance with the Code.

Audit commentary

Correction and estimation processes are the same and are called “substitution”. A document was provided detailing the “Metering Data Validation, Substitution and Estimation” procedures, which are regulated in Australia. The same processes is used for NZ retailers. In summary the following principles apply:

- data validation includes all of the requirements of clause 17 of schedule 15.2, including:
 - checks for missing data:
 - checks for invalid dates and times;
 - checks of unexpected zero values:
 - comparison with expected or previous flow patterns:
 - comparison of meter readings with data on any data storage device registers that are available:
 - a review of meter and data storage device event log
- estimation (substitution) processes include all of the requirements of clauses 15 and 19 of schedule 15.2

The validation and substitution processes are considered robust and comprehensive. The requirements of Part 15 are outside the scope of this audit because they are the responsibility of Retailers, which means the contents of this section will need to be included in Retailer’s next Reconciliation Participant audit report. If these services are provided to any other Reconciliation Participants, the audit for these parties will need to consider the compliance of these processes.

Any changes from NHH to HHR will be conducted at midnight to ensure the registry update and reconciliation processes are not adversely affected. There were no examples to examine.

Audit outcome

Compliant

CONCLUSION

This first full audit found four non-compliances. Two of the issues were minor and related to late registry updates. The most important issue is that agreements are not in place with Distributors regarding the design and functionality of metering installations. This matter needs to be resolved to ensure Distributors' requirements are met.

I've made three recommendations in relation to ATH practices and records. These matters have been raised with ATHs for several years now.

Controls are generally strong, and I consider the level of compliance to be high considering how new the processes are.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The future risk rating provides some guidance on this matter and recommends an audit frequency of 12 months. The next audit frequency was discussed with IntelliHUB and it was agreed that a shorter period of nine months may be more appropriate because in that time Category 2 and new connections processes will have commenced and a check of these after their introduction is considered prudent.

PARTICIPANT RESPONSE