

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

For

INTELLIHUB LIMITED

Prepared by: Brett Piskulic – Veritek Limited

Date audit commenced: 22 April 2021

Date audit report completed: 25 June 2021

Audit report due date: 27-Jun-21

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EXECUTIVE SUMMARY

Intellihub Limited (Intellihub) is a Metering Equipment Provider (MEP) and is required to undergo an audit by 27th June 2021 in accordance with clause 16A.14.

15 non-compliances were identified, which is an increase of one since the last audit.

Changes to the Code that were announced on 15th December 2020 and implemented on 1st February 2021 have impacted on compliance in five sections of this report. The changes have added new requirements for ATHs in the areas testing, certification of measuring transformers and recording of each available services access interface. The ATHs have not all been able to implement new processes to meet the new requirements which has caused non-compliance for the Intellihub MEP.

Intellihub has implemented new processes and reporting to meet the new requirements as they relate to data collection, particularly the maximum interrogation cycle and sum-check requirements, but these changes were not able to be implemented by 1st February 2021.

ATHs have improved their processes in relation to addressing installations with low burden which has led to a reduction in the number of non-compliant installations. But there were still three examples of category 2 installations certified with low burden. I checked a sample of 100 certification reports and found they contained a high number of errors. I have repeated the recommendations from the previous audit to improve controls in relation to the monitoring of ATH practices and records.

The other main areas of non-compliance related to following issues:

- late updating of registry information,
- inaccurate registry information, and
- expired and cancelled certification.

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 three months. After considering Intellihub's responses to the areas of non-compliance I recommend an audit frequency of nine months.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Services access interface	2.1	10.9(2)	Each services access interface not identified for 67 metering installations.	Weak	Low	3	Investigating
Provision of accurate information	2.5	11.2 and 10.6	All practicable steps not taken to ensure data is correct and that incorrect data is corrected as soon as practicable.	Moderate	Low	2	Investigating
Registry updates	3.2	2 of Schedule 11.4	480 registry updates later than 15 business days.	Moderate	Low	2	Investigating
Changes to registry records	4.10	3 of Schedule 11.4	Some records updated on the registry later than 10 business days.	Moderate	Low	2	Investigating
Accurate and complete records	5.1	4(1)(a) and (b) of Schedule 10.6	A high number of fields not accurate and complete in a sample of 100 Certification records.	Weak	Low	3	Investigating
Provision of registry information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some registry records incomplete or incorrect.	Moderate	Low	2	Investigating
Error correction	6.3	6 of Schedule 11.4	Discrepancies not resolved within 5 business days.	Moderate	Low	2	Investigating
Certification cancellation	6.4	20 of Schedule 10.7	Certification not cancelled on the registry for three metering installations where low burden is present.	Moderate	Medium	4	Investigating
Certification of metering installations	7.1	10.38 (a), clause 1 and clause 15 of	Certification expired, cancelled or late for 2,859 ICPs.	Moderate	Medium	4	Investigating

		Schedule 10.7					
Certification Tests	7.2	10.38(b)	Testing not conducted for one category 2 metering installation. Meter register not incrementing when raw meter data tests conducted on Intellihub meters with no decimal place.	Moderate	Low	2	Cleared
Interim certification	7.19	18 of Schedule 10.7	560 ICPs with expired interim certification.	Moderate	Medium	4	Investigating
Max interrogation cycle	10.5	8 of Schedule 10.6	Some meters not read during the maximum interrogation cycle.	Strong	Low	1	Cleared
Time errors	10.7	8(4) of Schedule 10.6	80 examples of clock errors outside the allowable thresholds in the most recent reports.	Strong	Low	1	Identified
Sum-check validation	10.9	8(9) of Schedule 10.6	1,886 meters failed sum-check prior to exemption coming into effect. Interrogation not successful within 25% of maximum interrogation cycle or 30 days for an unknown number of meters.	Moderate	Low	2	Identified
10.12. Investigation of AMI interrogation failures	10.12	8(11), 8(12) and 8(13) of Schedule 10.6	Reporting and processes not in place to resolve interrogation issues or change the AMI flag to "N" at 25% of the MIC or 30 days.	Strong	Low	1	Cleared
Future Risk Rating						35	
Indicative Audit Frequency						3 months	

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

RECOMMENDATIONS

Subject	Section	Recommendation	Remedial action
Accurate and complete records	5.1	Check metering installation certification reports to ensure compliance and improve controls to ensure certification records are complete and accurate.	Cleared
Accurate and complete records	5.1	Require Wells to change the layout of the certification report to include the more relevant items clearly on the front page.	Investigating
Certification Tests	7.2	Require ATHs to include details and results of all testing completed in the metering installation certification reports provided.	Investigating

ISSUES

Subject	Section	Recommendation	Description
		Nil	

1. ADMINISTRATIVE

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

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

I checked the Electricity Authority website for any exemptions in place.

Audit commentary

I checked the Electricity Authority website and I confirm there is an exemption in place regarding the sum-check process for fourmeter types as follows. The exemption came into force on 3rd May 2021 and expires on 31 May 2023.

Intellihub NZ Limited (“Intellihub”) is exempted from the complying with the obligation in clause 8(9) in Schedule 10.6 of the Electricity Industry Participation Code 2010 to ensure that each electronic interrogation of the metering installation that retrieves half hour raw meter data compares the sum of that data against the increment of the metering installation’s accumulating meter registers for the same period.

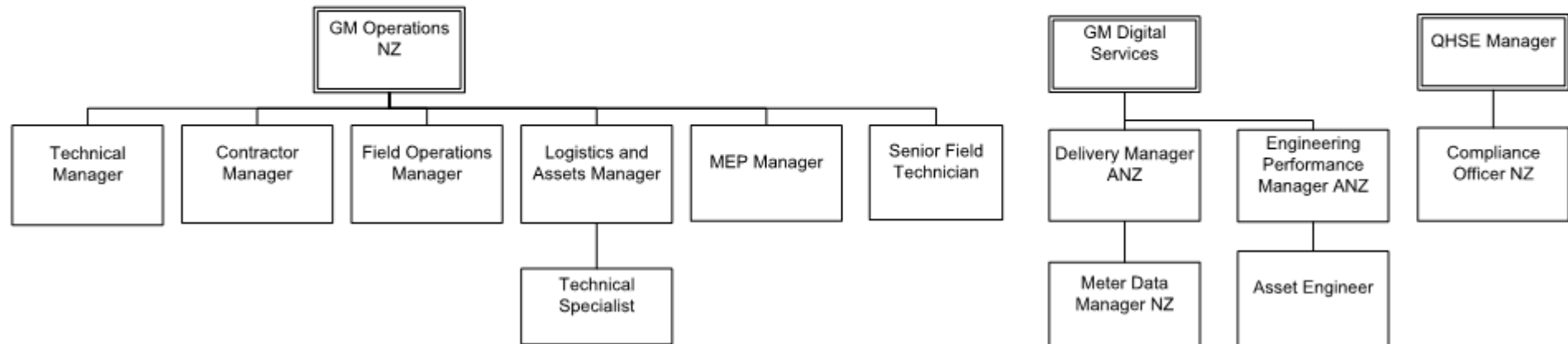
The meter types have been redacted from the gazette notice.

This is discussed further in **section 10.9**.

1.2. Structure of Organisation

The Intellihub organisation chart is shown below.

Team Members Involved with Intellihub (MTRX) MEP Audit



1.3. Persons involved in this audit

Auditor: Brett Piskulic

Veritek Limited

Electricity Authority Approved Auditor

Intellihub personnel assisting in this audit were.

Name	Title
Niu Nelson	MEP Manager
Chris Chambers	Compliance Officer NZ
Daniel Pinny	Delivery manager NZ
Paul Thornton	Technical Manager
Paul Wilson	Contractor Manager
Dennis Baldwin	Network Performance Manager
Hamish Sukha	Data Services Manager (AMI)
Gus Wolfgramm	Asset Engineer
George Diederer	Technical Specialist
Shane Broome	Logistics and Asset Manager
Hitesh Asarpota	Field Operations Manager

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, and*
- *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

Intellihub engages with ATHs to conduct certification activities, and Intellihub is an ATH. As an MEP, they have copies of all relevant records for installations above Category 1. They have copies of records attached to IWS for recent ICPs, but they rely on ATHs to manage and store Category 1 certification records for most ICPs. I requested certification reports for 100 ICPs to confirm their compliance and availability.

Audit commentary

All certification records were provided, which achieves compliance with this clause.

1.5. Hardware and Software

During the audit period Intellihub implemented a new asset management system, IWS to replace SAP. A material change audit was conducted in May 2020 to cover this change.

Intellihub MEP data is held in IWS, which is subject to backup arrangements in accordance with standard industry protocols.

AMI data collection occurs using four different head ends and the data is stored and managed in a Meter Data Management System (MDM), which is described further in **section 10**. These systems are also subject to backup arrangements in accordance with standard industry protocols.

1.6. Breaches or Breach Allegations

Intellihub confirmed there are no breach allegations relevant to the scope of this audit.

1.7. ICP Data

Metering Category	Number of ICPs
1	416,193
2	2,982
3	12
4	1
5	0
9	1235

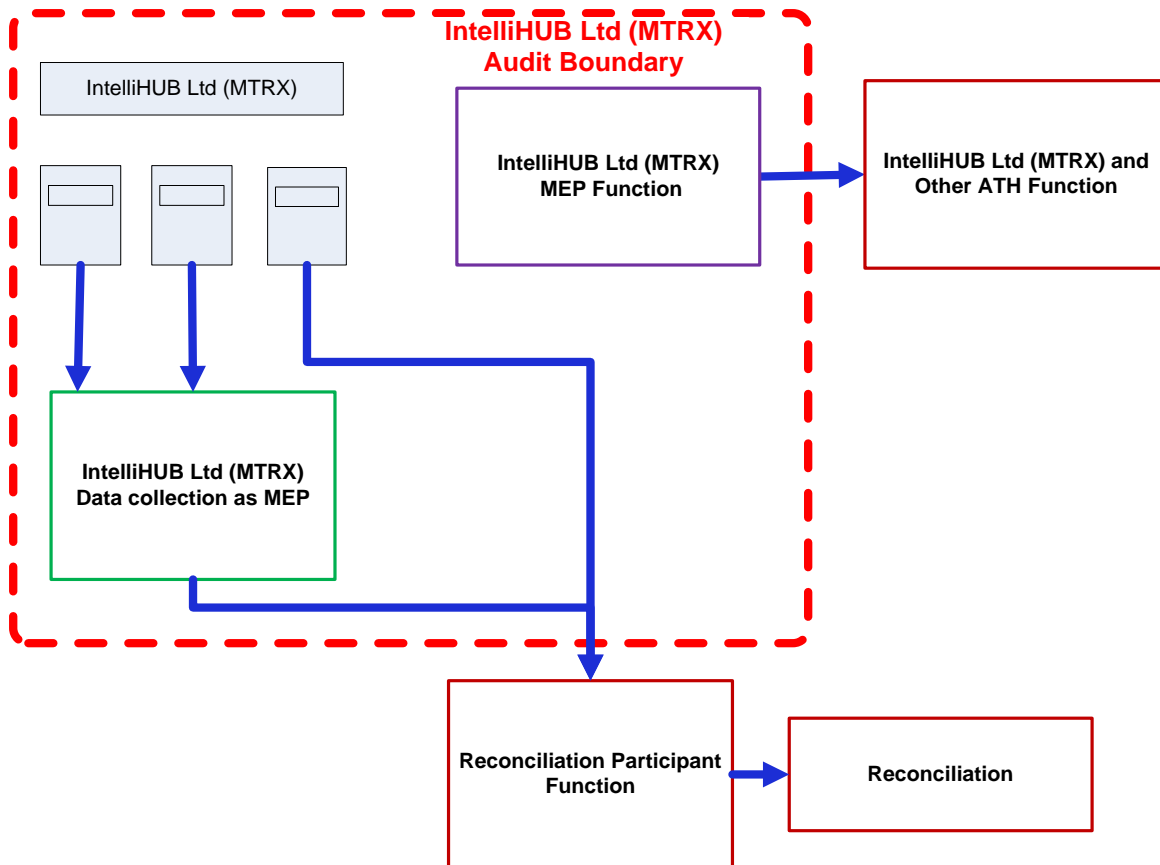
1.8. Authorisation Received

A letter of authorisation was not required or requested.

1.9. Scope of Audit

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

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



1.10. Summary of previous audit

The previous audit was conducted in May 2020 by Steve Woods of Veritek Limited. The table below shows that all of the issues remain.

TABLE OF NON-COMPLIANCE

Subject	Section	Clause	Non-Compliance	Status
Services access interface	2.1	10.9(2)	Services access interface not identified for two installations.	Still existing
Provision of accurate information	2.5	11.2 and 10.6	All practicable steps not taken to ensure data is correct and that incorrect data is corrected as soon as practicable. Revised AMI data only supplied for a 15-day period. 147 examples of incorrect timestamps for register reads.	Still existing
Registry updates	3.2	2 of Schedule 11.4	304 registry updates later than 15 business days.	Still existing
Changes to registry records	4.10	3 of Schedule 11.4	Some records updated on the registry later than 10 business days.	Still existing
Accurate and complete records	5.1	4(1)(a) and (b) of Schedule 10.6	Certification records not accurate and complete for 31% of a sample of 100.	Still existing
Provision of registry information	6.2	7 (1), (2) and (3) of Schedule 11.4	Some registry records incomplete or incorrect.	Still existing
Error correction	6.3	6 of Schedule 11.4	Discrepancies not resolved within 5 business days.	Still existing
Certification cancellation	6.4	20 of Schedule 10.7	Certification not cancelled on the registry for 31 metering installations where low burden is present.	Still existing
Certification of metering installations	7.1	10.38 (a), clause 1 and clause 15 of Schedule 10.7	Certification expired, cancelled or late for 2,983 ICPs.	Still existing
Insufficient load	7.7	14(3) of Schedule 10.7	Monitoring not conducted for at least 20 ICPs.	Cleared
Interim certification	7.19	18 of Schedule 10.7	751 ICPs with expired interim certification.	Still existing
Max interrogation cycle	10.5	8 of Schedule 10.6	One ICP not read during the maximum interrogation cycle.	Still existing
Time errors	10.7	8(4) of Schedule 10.6	36 examples of clock errors outside the allowable thresholds in the most recent reports.	Still existing

Sum-check validation	10.9	8(9) of Schedule 10.6	Approx. 3% of sum-check validations conducted using estimated midnight reads because the register read is for a time other than midnight.	Cleared
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TABLE OF RECOMMENDATIONS

Subject	Section	Clause	Description	Status
Accurate and complete records	5.1	Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Check metering installation certification reports to ensure compliance.	Still existing
Accurate and complete records	5.1	Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Require metering installation certification reports to be titled as such.	Cleared
Accurate and complete records	5.1	Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Require Wells to remove “default” details from certification reports.	Cleared
Accurate and complete records	5.1	Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Improve controls to ensure certification records are complete and accurate.	Still existing
Estimated AMI data	10.5	Regarding Clause 8 of Schedule 10.6.	Develop reporting to show the total quantify of estimated data per retailer per month, including the total quantity of estimated data that is not replaced with actual data where actual data exists.	Cleared

2. OPERATIONAL INFRASTRUCTURE

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

Code reference

Clause 10.9(2)

Code related audit information

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

Audit observation

I checked certification records for 100 metering installations, covering all relevant ATHs.

Audit commentary

The Code places responsibility for maintaining the services access interface on the MEP and places responsibility for determining and recording it with ATHs. The code was changed from 1st February 2021 to require the ATH to record each services access interface and the conditions under which each services access interface may be used. The code change was announced on 15th December 2021. Prior to this change the ATH was required to determine and record a single services access interface. 99 of the 100 certification records checked were completed after 1st February 2021. The one certification record completed prior to 1st of February 2021 had the services access interface recorded correctly.

32 of the 99 certification records identified all services access interfaces.

67 of the 99 certification records identified the services access interface as remote only for AMI metering installations. It is also possible that the services access interface may be local for these metering installations if there are problems communicating with the meters. The Intellihub, AMS and Wells ATHs have made changes to their processes to record each services access interface. The Delta ATH had not made any changes to its processes and did not include each services access interface on the reports checked. Due to the short timeframe of the implementation of the code change the ATHs were not able to meet the requirement from 1st February. A breakdown of each ATH is shown in the table below,

ATH	Each SAI recorded	Each SAI not recorded
Delta	0	15
Intellihub	10	37
AMS	13	13
Wells	9	2

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 10.9(2) From: 01-Feb-21 To: 27-May-21	Each services access interface not identified for 67 metering installations. Potential impact: None Actual impact: None Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as weak as they are not sufficient to identify errors in certification reports. There is no impact because the MEP normally determines the location of the services access interface; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
The Intellihub ATH has developed revised Category 1 and Category 2 Metering Installation Certification Report templates for use by new connections contractors, as well as making changes to Metering Installation Certification Reports for Intellihub ATH technicians. Reports now include all service access interfaces as appropriate. For both Category 1, and Category this will also include the conditions of use for each. Intellihub MEP in collaboration with our ATH will reissue communication to contracted ATH's to ensure their respective processes and related systems are set up to cover this requirement on-going.		01/08/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
As above, with some internal guidance to staff.		01/08/2021	

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

Code reference

Clause 10.50(1) to (3)

Code related audit information

Participants must in good faith use its best endeavours to resolve any disputes related to Part 10 of the Code.

Disputes that are unable to be resolved may be referred to the Authority for determination.

Complaints that are not resolved by the parties or the Authority may be referred to the Rulings Panel by the Authority or participant.

Audit observation

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

Audit commentary

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

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

Audit commentary

Intellihub uses the MTRX identifier in all cases.

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

Intellihub is the MEP for AMI metering installations where communication equipment is present. There are also some HHR metering installations with modems. I checked that the ATHs have processes in place 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. A copy of the type test schedule was provided, which contains a list of all components used and the type test report reference.

Audit outcome

Compliant

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

Code reference

Clause 11.2 and Clause 10.6

Code related audit information

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11.2 and Clause 10.6 From: 01-Jun-20 To: 27-May-21	All practicable steps not taken to ensure data is correct and that incorrect data is corrected as soon as practicable. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as moderate in this area because there are still a small number of areas where improvement can be made. Very few of the registry related discrepancies have an impact on participants, customers or settlement. The only relevant ones in this regard are tariff related and there were only a small number. The audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Intellihub has assigned dedicated resource to focus solely on data quality. Intellihub continues to work to identify areas for improvement as part of a continuous improvement cycle.		On-going	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	

As above	On-going	
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3. PROCESS FOR A CHANGE OF MEP

3.1. Change of metering equipment provider (Clause 10.22)

Code reference

Clause 10.22

Code related audit information

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

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

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

The gaining MEP is not required to pay costs if the losing MEP has agreed in writing that the gaining MEP is not required to pay costs, or the losing MEP has failed to provide notice within 40 business days.

Audit observation

Intellihub has not sent or received any invoices in relation to this clause.

Audit commentary

Intellihub has not sent or received any invoices in relation to this clause.

Audit outcome

Compliant

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

Code reference

Clause 2 of Schedule 11.4

Code related audit information

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

Audit observation

I checked the audit compliance report for the period 1 June 2020 to 22 April 2021 for all records where Intellihub became the MEP to evaluate the timeliness of updates.

Audit commentary

The table below shows that there were 480 late updates to the registry out of 1,272 events. 161 of the 480 late updates were due to the trader's nomination being later than five business days. Intellihub provided details of the causes of the late updates for a sample of 19 records which are listed below:

- late field notification or generation of certification report for six examples,
- exceptions found in information from ATH requiring follow-up for 10 examples,
- a processing issue leading to late updating for one example,
- correction of historical data identified during data cleansing for one example, and

- Intellihub was unable to upload data due to an incorrect nomination and event by another MEP for one example.

Event	Year	Total ICPs	ICPs Notified Within 15 Days	ICPs Notified Greater Than 15 Days	Average Notification Days	Percentage Compliant
New MEP	2017	19	9	10	49	47%
	2018	188	163	25	15	87%
	2019	2,343	2,144	199	8	92%
	2020	1,026	722	304	-	70.37%
	2021	1,272	792	480	-	62.26%

Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 3.2 With: Clause 2 of Schedule 11.4 From: 01-Jun-20 To: 22-Apr-21	480 registry updates later than 15 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
Low	Controls are in place to manage timeliness, but improvements are required to ensure late notifications from the field and exceptions are reduced. The impact on other participants is minor; therefore, the audit risk rating is low.	
Actions taken to resolve the issue		Completion date
Intellihub is reviewing the mechanisms for interacting with contracted ATH's with a view to reducing time delays in retrieving data. Intellihub will also be investigating opportunities to improve work order exchanges with Traders.		July 2021
Preventative actions taken to ensure no further issues will occur		Completion date
Intellihub will continue to provide feedback on exceptions to ATH's and remind them of their obligations to promptly return paperwork.		On-going
Remedial action status		Investigating

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

Code reference

Clause 5 of Schedule 10.6

Code related audit information

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

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

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

Audit observation

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

Audit commentary

No requests have occurred during the audit period. Some requests have been made to Intellihub to reverse their meter removal event in the registry, so that the gaining MEP can upload their data.

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

I confirmed that Intellihub has ceased to be responsible for some metering installations by checking the event detail report. I then checked the records for a selection of five decommissioned ICPs.

Audit commentary

Intellihub continues with their responsibilities, mainly in relation to the storage of records, which are kept indefinitely. I checked five decommissioned ICPs. The records are still available for all five.

Audit outcome

Compliant

4. INSTALLATION AND MODIFICATION OF METERING INSTALLATIONS

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

Code reference

Clause 2 of Schedule 10.7

Code related audit information

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

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

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

Audit observation

I checked the suite of design reports provided by Intellihub to relevant ATHs, and I checked that ATHs were correctly recording the design report in the certification records.

Audit commentary

The design reports include all relevant details required by the Code and ATHs had correctly recorded the design for all 100 metering installations checked. There were no new design reports produced during the audit period.

Audit outcome

Compliant

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

Code reference

Clause 9 of Schedule 10.6

Code related audit information

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

Audit observation

I confirmed which ATHs had been used during the audit period, in order to check the Authority's website for scope of approval.

Audit commentary

Intellihub has used the AMS, Delta, Intellihub and Wells ATHs during the audit period and they all have a current and appropriate scope 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 the processes used by Intellihub to ensure compliance with the design and with the error thresholds stipulated in Table 1. I also checked the certification records for 100 metering installations.

Audit commentary

All selected component processes are compliant, as confirmed by checking certification records.

For Category 2 comparative certification, AMS, Delta, Intellihub and Wells ATHs have compliant practices for the calculation of uncertainty.

With regard to the design of the installation (including data storage device and interrogation system), Intellihub ensures 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.

Intellihub ensures the metering installation complies with the design report and the requirements of Part 10 by requiring ATH's to confirm the installation matches the design, or by requiring updates to be provided if the installation does not match the design. The design report was correctly recorded in the certification records for the 100 installations I checked.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

MEPs must ensure that the metering installation records imported electricity separately from exported electricity. For category 1 and 2 installations the MEP must ensure the metering installation records imported and exported electricity separately for each phase.

For metering installations for ICPs that are not also NSPs, the MEP must ensure that the metering installation does not use subtraction to determine submission information used for the purposes of Part 15.

Audit observation

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

Audit commentary

Intellihub does not have any metering installations where subtractive metering is used.

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

I checked the records for all 13 ICPs where the metering category was greater than Category 2.

Audit commentary

All 13 metering installations are HHR metered.

Audit outcome

Compliant

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

Code reference

Clause 4(3) of Schedule 10.7

Code related audit information

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

Audit observation

Intellihub is not responsible for any NSP metering.

Audit commentary

Intellihub is not responsible for any 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 is not responsible for any grid metering.

Audit commentary

Intellihub is not responsible for any grid metering.

Audit outcome

Not applicable

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

Code reference

Clause 4(4) of Schedule 10.7

Code related audit information

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

Audit observation

I checked the certification records for all ATHs to confirm this point is being considered at the time of certification.

Audit commentary

The certification records for all ATHs contain a field or a statement in relation to this clause and the technician is required to confirm that installations are compliant and safe.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

- *functionality for controllable load.*

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

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

Audit observation

I checked previous communication regarding metering designs, and I checked whether there were any new or modified designs during the audit period.

Audit commentary

Intellihub has communicated with all Distributors and Traders in relation to this requirement. There were no new or modified designs during the audit period.

At the time of the audit Intellihub were working on updating all of its design reports and were in the process of consulting with the distributors and traders.

Audit outcome

Compliant

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

Code reference

Clause 3 of Schedule 11.4

Code related audit information

If the MEP has an arrangement with the trader the MEP must advise the registry manager of the registry metering records, or any change to the registry metering records, for each metering installation for which it is responsible at the ICP, no later than 10 business days following:

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

If the MEP is update the registry in accordance with 8(11)(b) of Schedule 10.6, 10 business days after the most recent unsuccessful interrogation.

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

Audit observation

I checked the audit compliance report for the period 1 June 2020 to 22 April 2021 for all records where Intellihub became the MEP to evaluate the timeliness of updates.

Audit commentary

The table below shows that registry updates were on time for 85.62% of new connections. 256 of the 860 late updates had trader nominations later than five business days. Intellihub provided details of the causes of the late updates for a sample of 22 records which are listed below:

- late field notification or generation of certification report for three examples,
- exceptions found in information from ATH requiring follow-up for two examples, and
- a processing issue due to checking MEP nomination leading to late updating for 17 examples.

80.90% of updates after recertification were populated within 10 business days. Intellihub provided details of the causes of the late updates for a sample of 19 records which are listed below:

- late field notification or generation of certification report for seven examples,
- exceptions found in information from ATH requiring follow-up for seven examples,
- correction of historical data identified during data cleansing for seven examples,
- a processing issue leading to late updating for three examples, and
- one meter was replaced without the knowledge of Intellihub.

Event	Year	Total ICPs	ICPs Notified Within 10 Days	ICPs Notified Greater Than 10 Days	Average Notification Days	Percentage Compliant
New connection	2017	897	815	82	5.8	91%
	2018	1,699	1,435	264	7.7	85%
	2019	2,315	2,093	222	7.0	90%
	2020	4,400	3,704	696	Not calculated	84.18%
	2021	5,981	5,121	860	Not calculated	85.62%
Update (recertification updates only from 2020 onwards)	2017	139,000	5,000	134,000	N/A	3.6%
	2018	7,336	2,052	5,284	626	28%
	2019	22,503	20,864	1,639	5.0	93%
	2020	7,001	5,236	1,765	17.66	74.79%
	2021	8,157	6,599	1558	24.14	80.90%

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 4.10 With: Clause 3 of Schedule 11.4 From: 01-Jun-20 To: 22-Apr-21	Some records updated on the registry later than 10 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2

Audit risk rating	Rationale for audit risk rating		
Low	<p>I have recorded the controls as moderate in this area because they haven't changed since the last audit, and they are sufficient to ensure most updates are on time but there is considerable room for improvement.</p> <p>The late updates for new connections occurred after the trader had populated their records, therefore the impact on participants, customers or settlement is minor, therefore the audit risk rating is low.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
Field techs advised of the importance of the accurate and timely return of paperwork.		On-going	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Intellihub will continue to provide feedback on exceptions to contractors and remind them of their obligations to return paperwork promptly		On-going	

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

Intellihub has AMI data collection systems, and these are considered "metering infrastructure". I checked that the systems operate as intended and are compatible with all metering components interrogated, by examining the success rate of data collection along with the number of events generated.

Audit commentary

There were no obvious issues with the operation of the AMI systems. All components operate as intended in an integrated manner.

Audit outcome

Compliant

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

Code reference

Clause 10.23A

Code related audit information

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

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

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

Audit observation

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

Audit commentary

They have not approved any burden or compensation factor changes without recertification occurring. A check of certification records confirmed compliance.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

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

Audit observation

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

Audit commentary

Intellihub advised that there were no firmware or software changes during the audit period.

Audit outcome

Compliant

4.15. Temporary Electrical Connection (Clauses 10.29A)

Code reference

Clause 10.29A

Code related audit information

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

Audit observation

Intellihub is not responsible for any grid metering.

Audit commentary

Intellihub is not responsible for any grid metering.

Audit outcome

Compliant

4.16. Temporary Electrical Connection (Clause 10.30A)

Code reference

Clause 10.30A

Code related audit information

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

Audit observation

Intellihub is not responsible for any NSP metering.

Audit commentary

Intellihub is not responsible for any NSP metering.

Audit outcome

Compliant

4.17. Temporary Electrical Connection (Clause 10.31A)

Code reference

Clause 10.31A

Code related audit information

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

Audit observation

I checked for examples where the metering installation certification date was prior to the initial electrical energisation date of the ICP to determine whether there were any examples of temporary electrical connection for the purposes of testing and certification.

Audit commentary

There were no temporary connections of ICPs where Intellihub is the MEP during the audit period.

Audit outcome

Compliant

5. METERING RECORDS

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

Code reference

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

Code related audit information

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

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

Audit observation

I checked certification records for 100 metering installations, and I also checked all available inspection records to evaluate compliance with this clause.

Audit commentary

All 100 certification reports were available. I also requested meter calibration reports and CT calibration reports for all 100 certifications, which were provided. I found a number of errors in the metering installation certification reports. The table below shows a breakdown of the number of records checked for each ATH.

ATH	Total reports checked
Intellihub	47
Wells	11
Delta	16
AMS	26
Total	100

The errors identified are shown in the table below.

Error	Intellihub	Wells	Delta	AMS
Incorrect certification method		5		
Comparative certification with CTs recorded as certified	23	5		
Each Services access interface and both HHR + NHH not recorded	37	2	15	13
Incorrect maximum interrogation cycle	1		4	13
Burden range not recorded in CT certification report				13
Incorrect CT certification expiry dates	4			
Test results missing			16	14

In addition to the errors recorded above, there is also a problem with identification of certification records. In particular, whether a document is a “Metering Installation Certification Report” or whether it is a job completion report or a commissioning report. The Code is specific regarding what a “Metering Installation Certification Report” must contain. The fields are listed below.

Clause	Field required
10.9(3)(b) & Clause 10 of Schedule 10.4 & Clause 8(2)(c) of Schedule 10.7	Each services access interface
10.11 & 8(4) of Schedule 10.7	Metering installation category
10.35	Loss compensation details
6(4) of Schedule 10.7	Certification as a lower category details
8(2) of Schedule 10.7	Whether the installation is HHR or NHH or HHR and NHH
11(5)(a) & 13(4) of Schedule 10.7	Confirmation ATH has checked the design report
11(5)(b) of Schedule 10.7	Confirmation that components have been calibrated and certified
11(5)(c) & 12(4)(c) of Schedule 10.7	Confirmation that table 3 tests have been conducted and passed
11(5)(d) of Schedule 10.7	Confirmation that wiring is correct
11(5)(e) of Schedule 10.7	Details of tests and checks to confirm the integrity of the installation
11(6) of Schedule 10.7	Details of compensation factors
12(5) of Schedule 10.7	Confirmation that components in comparative certified installations are fit for purpose

13(5) of Schedule 10.7	Confirmation that table 4 tests have been conducted and passed
14(2) of Schedule 10.7	Additional integrity checks for insufficient load certification
17(1) of Schedule 10.7	Installation certification expiry date
22(3) of Schedule 10.7	Percentage error
26(4) of Schedule 10.7	Maximum interrogation cycle
27(5) of Schedule 10.7	Meter certification expiry date
29(3) of Schedule 10.7	Measuring transformer expiry date
33(2)(b) of Schedule 10.7	Control device certification date
33(2)(d) of Schedule 10.7	Confirmation that control device is compliant and fit for purpose
37(1) of Schedule 10.7	Data storage device expiry date

I repeat the recommendation from the last audit that Intellihub checks all certification reports from relevant ATHs to ensure they are compliant and fit for purpose and improve controls to ensure certification records are complete and accurate. A common definition of “fit for purpose” is “good enough to do the job it was designed to do”. Certification reports are designed to record and convey information about metering installations. If they are inaccurate and/or unclear, they are not fit for purpose and should be changed. The last audit also included a recommendation that Metering Installation Certification Reports are titled as such. There have been improvements in the titles as detailed in the table below.

ATH	Name of metering installation certification report 2020	Name of metering installation certification report 2021
Wells	General job detail report	Metering installation certification report
Intellihub	Metering installation certification report	Metering installation certification report, or CT metering certification report
Delta	Not titled	Metering installation certification report
AMS	Metering installation certificate	Metering installation certificate, or Category One Site Certificate

In the last audit it was recommended that Intellihub requires better clarity in the Wells ATHs metering installation certification reports. There have been improvements made to the Wells reports but they are still difficult to interpret, and the relevant information is spread throughout many different pages of the reports. I recommend that Intellihub requires Wells to change the layout of the report to include the more relevant items clearly on the front page, as follows:

- ICP,
- metering installation certification date,
- metering installation certification expiry date,
- metering category,

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

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Check metering installation certification reports to ensure compliance and improve controls to ensure certification records are complete and accurate	Intellihub agrees with this recommendation. The Intellihub MEP has received rigorous training by our ATH to ensure a focus on capturing the correct data.	Cleared

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 4(1)(a) and (b) of Schedule 10.6	Require Wells to change the layout of the certification report to include the more relevant items clearly on the front page.	Intellihub agrees with this recommendation. ; Intellihub will continue to engage with Wells with the objective of obtaining concise, summarized Metering Installation Certification Data in an easily assimilated format.	Investigating

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 5.1 With: Clause 4(1)(a) and (b) of Schedule 10.6 From: 01-Jun-20 To: 22-Apr-21	A high number of fields not accurate and complete in a sample of 100 Certification records. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 3
Audit risk rating	Rationale for audit risk rating
Low	The controls require strengthening to ensure record accuracy issues are identified as soon as possible. The impact is minor for most fields. Incorrect certification dates and methods can be misleading and can lead to re-work.

Actions taken to resolve the issue	Completion date	Remedial action status
<p>Intellihub has reallocated tasks within teams with the objective of reducing the time taken, and the number of inaccuracies, when creating Metering Installation Certification Reports</p> <p>As a result of recommendations from the last audit, Intellihub have a dedicated resource to quality check records.</p> <p>Intellihub will continue to engage with ATH's on better clarity and presentation of certification reports to ensure these are fit for purpose.</p>	On-going	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Intellihub will continue to engage with ATH's on better clarity and presentation of certification reports to ensure these are fit for purpose.</p>	On-going	

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

Code reference

Clause 4(2) of Schedule 10.6

Code related audit information

The MEP must, within 10 business days of receiving a request from a participant for a signed inspection report prepared under clause 44 of Schedule 10.7, make a copy of the report available to the participant.

Audit observation

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

Audit commentary

Intellihub has not been requested to supply any inspection reports, but these are available and can be supplied on request.

Audit outcome

Compliant

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

Code reference

Clause 4(3) of Schedule 10.6

Code related audit information

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

Audit observation

I checked a directory of metering records from 2017 to confirm compliance.

Audit commentary

Intellihub keeps records indefinitely and the availability of the 2017 records confirms compliance.

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 has provided information to ATH's in the past, and this may occur in future. There are no current examples to examine.

Audit commentary

Intellihub has provided information to ATH's in the past, and this may occur in future. There are no current 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 switch breach detail report for the period 1 June 2020 to 22 April 2021 to confirm whether all responses were within 10 business days.

Audit commentary

All MN files were sent within 10 business days.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

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

Audit observation

I checked the audit compliance report and list file for 100% of records and I checked the Category 1 inspection records to identify discrepancies.

Audit commentary

Analysis of the list file and audit compliance report for the period 1 June 2020 to 22 April 2021 for all Intellihub ICPs found the issues detailed in the table below.

Quantity of ICPs May 2021	Quantity of ICPs Mar 2020	Quantity of ICPs May 2019	Quantity of ICPs July 2018	Issue	Comments
1	6	10	52	Blank records on the registry.	Trader had recorded MEP as MNON, has now been updated to MTRX and the registry populated.
0	0	0	0	Category 1 ICPs with CTs.	
0	0	0	0	Interim certified installations over Category 1.	-
0	0	0	0	Incorrect compensation factors of 2 or 14, which should have been 1.	-
0	0	0	0	Category 3 NHH.	-
54	124	205	9,044	Incorrect interim expiry dates. These appear to be fully certified with incorrect "I" flag.	These are currently being investigated and will be resolved by end of July 2021. We will put processes in place to identify these exceptions to ensure they no longer occur.
0	0	0	0	Category 1 with certification duration of more than 15 years.	-
0	0	0	0	Category 1 with certification date the same as certification expiry date.	-
0	0	1	1	Incorrect certification date or certification expiry date for Cat 2.	-
0	3	7	4	Incorrect certification date or certification expiry date for Cat 1.	-
0	0	0	0	IN24 as register content code and period of availability.	-
0	0	0	0	IN0 as register content code and period of availability.	-
0	0	0	0	CN24 as register content code and period of availability. Some of these should be CN13.	-

0	0	0	0	D24 and should be D16.	-
0	0	0	0	N24.	-
0	0	0	0	UN0.	-
0	0	0	0	UN12 or UN19.	-
0	0	0	0	Day with no night.	-
0	0	0	0	Night with no day.	-
0	0	7	0	CN only on residential.	-
2,823	2,823	25 22 excluding duplicates	78	UN with a control device	UNL/VECT where MTRX have an arrangement/agreement with Traders that as the pilot is decommissioned in this network, we have changed the RCC to UN and in most cases, left the LCD on site.
2 both have meter cat9 (removed)	2 both have meter cat9 (removed)	7 2 have meter cat9 (removed)	10	Max interrogation cycle of zero days.	Intellihub have corrected the records and will add a validation rule to our reconciliation tool.
1,121	1,235	1,148	1,248	Controlled tariff with no load control device.	893 ICPs are within the UNL/VECT where the pilot is decommissioned. Some of these cases may be that the Retailer has requested that the RCC/POA remain so there is not impact to customer billing. Intellihub will further engage with these Retailers. The remaining icps will require field visits.
127	119	40	31	Export ICPs with no injection register.	Intellihub have processes in place to capture when the Network changes the installation type to B. In those cases, we reach out to Retailers to see if the current meter on site is fit for purpose or if a site visit is required to change metering. Intellihub will not alter metering unless

					authorised by the Retailer to do so.
1	11	1	13	Stat sampled with a certification duration greater than 7 years	Incorrect certification number was used as meter replacement took place and the correct certification number was not updated. This has been corrected.
0	0	0	7	Incorrect ATH recorded	-
11,573	-	-	-	Incorrect ATH identifier of VEMS used, should be recorded as VCOM since 28/9/2018	Intellihub are engaging with VCOM as it seems some returned paperwork still have VEMS. If the requirement is to change the participant code, we will need to make changes to our systems to for a new participant.

The inspection process found the following issues:

Count of ICPs	Description
52	The inspector could not report on the installation certification expiry date, because the installation certification sticker was unreadable, faded, damaged and missing.
105	The installation certification expiry date in the MEP's records did not match the installation certification sticker.
24	Intellihub MEP records describe load control devices utilising an allocated asset number which does not match the actual manufacturer's serial number at the premise.
6	Intellihub records have incorrect relay serial number.
4	Control device recorded in Intellihub systems, but not found on site.
20	Load control found on site, but no serial number recorded in Intellihub systems.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.2 With: Clause 7 (1), (2) and (3) of Schedule 11.4 From: 01-Jun-20 To: 22-Apr-21	Some registry records incomplete or incorrect. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2

Audit risk rating	Rationale for audit risk rating		
Low	<p>I have recorded the controls as moderate in this area because there are still a small number of areas where improvement can be made. ATH accuracy is a good example.</p> <p>Very few of the discrepancies have an impact on participants, customers or settlement. The only relevant ones in this regard are tariff related and there were only a small number. The audit risk rating is low.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Intellihub have good controls in place to ensure no new data discrepancies are sent to the Registry.</p> <p>Intellihub will continue to work with Participants for access to sites where site visits are required to help resolve some of the discrepancies identified in the table above, and have placed a lot of focus on achieving quality outcomes</p>		On-going	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Intellihub has appointed a permanent trainer working with our staff, particularly with new employees to ensure a robust focus on quality</p>		January 2021	

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

Code reference

Clause 6 of Schedule 11.4

Code related audit information

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

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

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

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

Audit observation

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

Audit commentary

This clause is specific and prescriptive, and it requires a complete metering record comparison to be undertaken. Intellihub is conducting a complete validation, but errors are not being corrected within five business days, as recorded in **section 4.10**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 6.3 With: Clause 6 of Schedule 11.4 From: 01-Jun-20 To: 27-May-21	Discrepancies not resolved within 5 business days. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as moderate in this area because there are still a small number of areas where improvement can be made. Certification date accuracy is a good example. Very few of the discrepancies have an impact on participants, customers or settlement. The only relevant ones in this regard are tariff related and there were only a small number. The audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
IntelliHub is working towards resolving discrepancies which have the highest impact on participants.		Ongoing	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
IntelliHub is committed to an ongoing focus on continuous improvements to the quality and completeness of all of its transactions.		Ongoing	

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

Code reference

Clause 20 of Schedule 10.7

Code related audit information

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

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

- of a group of meters in the statistical sampling recertification process for the metering installation, or the failure of a certification test for the metering installation,*
- d) the manufacturer of a metering component in the metering installation determines that the metering component does not comply with the standards to which the metering component was tested,*
 - e) an inspection of the metering installation, that is required under this Part, is not carried out in accordance with the relevant clauses of this Part,*
 - f) if the metering installation has been determined to be a lower category under clause 6 and:

 - (i) the MEP has not received the report under 6(2A)(a) or 6(2A)(b); or*
 - (ii) the report demonstrates the maximum current is higher than permitted; or*
 - (iii) the report demonstrates the electricity conveyed exceeds the amount permitted,**
 - g) the metering installation is certified under clause 14 and sufficient load is available for full certification testing and has not been retested under clause 14(4)*
 - h) a control device in the metering installation certification is, and remains for a period of at least 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.*
 - j) the installation is an HHR AMI installation certified after 29 August 2013 and

 - (i) the metering installation is not interrogated within the maximum interrogation cycle; or*
 - (ii) the HHR and NHH register comparison is not performed; or*
 - (iii) the HHR and NHH register comparison for the same period finds a difference of greater than 1 kWh and the issue is not remediated within three business days.**

A metering equipment provider must (unless the installation has been recertified within the 10 business days) 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.

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

Audit observation

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

Audit commentary

I checked all of the points mentioned above as follows,

Bridged meters

I checked eight examples of bridged meters from the current audit period, and they were all recertified correctly. Certification was cancelled as soon as Intellihub was advised of the bridging. Compliance is confirmed.

Current transformer in-service burden

Clause 31 of schedule 7 was changed from 1st February 2021 to require the ATH to ensure that the in-service burden is within the burden range of the measuring transformers when certifying metering installations. The code change was announced on 15th December 2021. I checked a sample of 58 category 2 certifications certified after 1st February 2021 to confirm compliance. Three of the 58 metering installations were certified with in-service burden lower than the burden range of the current transformers as detailed in the table below,

ICP	ATH	CT make & model	CT Ratio	Rated burden	Burden range VA	Lowest in-service burden	Burden resistors added
0000559498NR3A7	Intellihub	TWS SBO98	200/5	2.5	0.625-2.5	0.315	No
0000921123TU3EC	Wells	TWS Z77B	200/5	5	1.25-5	0.56	No
0000921487TUFFC	Wells	TWS EV86A	300/5	5	1.25-5	0.35	No

I have recorded non-compliance for the three metering installations with in-service burden lower than the burden range of the current transformers. The current transformers are not fit for purpose when operating outside their burden range and certification has not been cancelled.

Insufficient load certification

Three metering installations were identified in my checks of 58 category 2 certification records which were certified in accordance with the insufficient load clause and required monitoring. I checked and confirmed that all three had been added to the list maintained by Intellihub of installations requiring monitoring and confirmed that monitoring had taken place each month. Compliance is confirmed.

Certification at a lower category

One metering installation was identified in my checks of 59 category 2 certification records which was certified at a lower category and required monitoring to ensure that the load does not exceed the category limit. I checked and confirmed that it had been added to the list maintained by Intellihub of installations requiring monitoring and confirmed that monitoring had taken place each month. Compliance is confirmed.

Inspection

One Category 3 inspection was due during the audit period and was conducted within the allowable time period.

Sample inspection was completed for category 1 metering installations as required. Compliance is confirmed.

Maximum interrogation cycle

I checked for examples where meters were not interrogated within the maximum interrogation and the AMI flag is still "Y" and certification was not cancelled. As recorded in **section 10.5** no examples were identified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 6.4 With: Clause 20 of Schedule 10.7 From: 01-Feb-21 To: 27-May-21	Certification not cancelled on the registry for three metering installations where low burden is present. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	Rationale for audit risk rating

Medium	<p>I have recorded the controls as moderate in this area because most processes are managed with sufficient controls to avoid cancellation of certification. The controls have improved with regard to installations with low burden as ATHs are adopting new processes in line with the February 1st code change.</p> <p>Whilst the overall error has been recorded as less than the 2.5% maximum it has been shown that under burdened CTs can result in an increase in error of 0.5%. I have recorded the impact as medium.</p>		
Actions taken to resolve the issue	Completion date	Remedial action status	
Intellihub agrees with this finding. Certification for the 3 ICP's identified has been cancelled on The Registry and site visits organized to recertify and to address burden.	01/08/2021	Investigating	
Preventative actions taken to ensure no further issues will occur	Completion date		
The guidance given in our CT burdening procedure has been by amended to ensure that it clearly includes instructions on the burdening of very low burden rated CTs. The anticipated solution is to check measured values against calculated burden values from cable lengths and characteristics, then ensuring that the final recorded burden values are within the required limits. This process is validated by repeating the tests for different primary current values or adding one or two metres of standard copper wire.	24/06/2021		

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

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

Audit commentary

The registry shows 2,851 Category 1 ICPs with expired certification. This is similar to the 2,894 during the last audit. 560 of these ICPs show as previously interim certified. 696 ICPs were previously certified, and certification expired within the audit period.

Intellihub provided a summary of ICPs where certification was unable to be physically performed. This summary is shown in the table below and affects 1,404 ICPs.

Reason	Quantity
Already AMI Meter	1
Contractor Turndown	7
Meter Board Obstructed	17
Meter Incompatibility	54
No Access	707
No Power at Site	6
Refusal	205
Retailer request to cancel	52

Safety	231
Site Location	59
Tamper	1
Trader switch out	64
Grand Total	1404

The registry shows five Category 2 ICPs with expired certification. Intellihub provided details of the reasons they have been unable to recertify due to access problems in the table below.

ICP	Certification date	Expiry date	Intellihub comments
0286371758LC9A0	25/03/2010	25/03/2020	Turndown due to safety wiring (comms downloaded)
0160154022LCD90	16/01/2009	13/10/2018	Turndown, remediation work to be undertaken on the switchboard/montrose box by Akld city council (comms downloaded)
0143676032LC666	14/01/2009	14/01/2019	Turndown, Aggressive customer wont allow access (comms downloaded)
0224066773LCE27	20/07/2010	20/07/2020	Turndown, Angry customer wont give access (comms downloaded)
0102944679LCC92	23/03/2011	23/03/2021	Trader has not supplied a job, emailed 3 times (comms downloaded)

As recorded in **section 6.4**, three metering installations have cancelled certification due to low burden.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 7.1 With: Clause 10.38 (a), clause 1 and clause 15 of Schedule 10.7 From: 01-Jan-98 To: 22-Apr-21	Certification expired, cancelled or late for 2,859 ICPs. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	Rationale for audit risk rating

Medium	<p>I have recorded the controls as moderate in this area because certification has been expired for a number of years for some ICPs and because some of the expired installations were fully certified at one point.</p> <p>The impact on settlement is recorded as moderate because of the increased likelihood of failure or inaccuracy for metering installations with expired certification, therefore the audit risk rating is medium.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>Intellihub has been working proactively with Retailers to gain access to metering installations which have expired certification.</p> <p>Intellihub has systematically maintained records of communications with Retailers to provide evidence of our proactive engagement.</p> <p>Intellihub has also maintained records of Consumer turndowns, along with the specific turndown reasons, when approached by contracted ATH's.</p>	On-going.	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>All actions and retailer communications trails are now documented and stored for records; we also store the UTC (Unable to Complete or Turndown) history for the majority of expired metering installations where we have been unable to complete recertification activity.</p>	On-going	

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

Code reference

Clause 10.38(b) and clause 9 of Schedule 10.6

Code related audit information

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

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

Audit observation

I checked the certification records for 100 metering installations to confirm compliance.

Audit commentary

Certification activities have been conducted by the AMS, Delta, Intellihub and Wells ATHs.

Category 2 certification tests

The certification reports for 57 of the 59 category 2 installations included test results which confirmed that all required testing had been completed.

The certification report provided by the AMS ATH for ICP 0000531005NR042 contained the following statement from the technician, "Meter Hang Only. Collected old meters and relay. Installed new meter.

Unable to certify as changeover took longer than expected and I had to get to next job.” In this case the registry has been updated to indicate that the installation was certified but the certification report states that no testing was conducted. Non-compliance is recorded.

The certification report provided by the Delta ATH for ICP 0006434209AL37E included a statement confirming that all the required tests had been completed, recorded and passed. I recommend that Intellihub requires ATHs to include details and results of all testing completed in the metering installation certification reports provided.

Category 1 certification tests

I checked a sample of 41 category 1 certification reports conducted after 1st February 2021 to confirm if all required testing had been completed. All 41 certification reports contained a statement confirming testing had been completed. All 13 of the certification reports from the Wells and Intellihub ATHs included the results of the tests conducted. I recommend that Intellihub requires ATHs to include details and results of all testing completed in the metering installation certification reports provided.

The testing requirements were changed from 1st February 2021 introducing the requirement for ATHs to ensure that the change in the meter register that occurs when conducting a raw meter data test is at least “1” in the least significant digit, or one mark if the least significant digit does not have numerical markings. Intellihub uses a number of meter types which do not have a decimal place in the meter register. It is very difficult for ATHs to meet the new requirement when there is no decimal place as the technician will need to conduct the raw meter data test over a long period of time and count a high number of pulses. 34 of the certification reports checked were installations containing meters with no decimal place where the requirement for the meter register to advance by “1” was not met. I have recorded non-compliance as the raw meter data test was not completed as required. Intellihub advised at the time of the audit that they have now advised all ATHs to ensure that the meter register does advance as required regardless of the time taken to conduct the test. Intellihub is also working on a technical solution which will allow sufficient load to be applied to conduct the test in a more timely manner.

Intellihub has previously advised ATHs that the requirement to conduct a register advance test was met by confirming that the meter pulsed with the application of load. This meets the requirements for a register advance test both before and after the 1st February changes.

A breakdown of the certification reports checked and recording of test results is detailed in the table below,

ATH	Total Cat 1 reports checked	Reports with test results not recorded	Cat 1 certification of meter with no decimal place
Intellihub	8	0	4
Wells	5	0	4
Delta	15	15	14
AMS	13	13	12
Total	41	28	34

Recommendation	Description	Audited party comment	Remedial action
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Regarding Clause 10.38(b)	Require ATHs to include details and results of all testing completed in the metering installation certification reports provided.	Intellihub will engage with ATHs to ensure that the details and results of all testing completed in the metering installation certification reports are provided.	Investigating
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Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 7.2 With: Clause 10.38(b) From: 23-Oct-20 To: 27-May-21	Testing not conducted for one category 2 metering installation. Meter register not incrementing when raw meter data tests conducted on Intellihub meters with no decimal place. Potential impact: Medium Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate as Intellihub has taken steps to ensure that the raw meter data test requirements are now met, though further checking is required to ensure all required testing is conducted by ATHs. There is no impact as the Intellihub has confirmed that the meter register will increment when the meter pulses; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Intellihub to revisit the one individual Category 2 metering installation. This is currently being planned with the Retailer and ATH.		August 2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Intellihub has instructed all ATH's working for the Intellihub MEP to conduct the register advance check as an integral element of the Raw Meter Data Output Test.		Completed	

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

Code reference

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

Code related audit information

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

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

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

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

All other installations must measure and separately record:

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

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

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

Audit observation

I checked the certification records for 59 metering installations to confirm compliance.

Audit commentary

All relevant metering is compliant with this clause.

Audit outcome

Compliant

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

Code reference

Clause 10.37(2)(b)

Code related audit information

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

Audit observation

This clause relates to Transpower as an MEP.

Audit commentary

This clause relates to Transpower as an MEP.

Audit outcome

Not applicable

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

Code reference

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

There are no examples of burden changes having occurred.

Audit outcome

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

Audit commentary

Intellihub has a list of Category 2 metering installations with CT ratios above 500/5. There are a small number where the protection or transformer rating is greater than 500A or is unknown. Monitoring is in place for all of these, and none have a demand over the allowable threshold.

One metering installation was identified in my checks of 59 category 2 certification records which was certified at a lower category and required monitoring to ensure that the load does not exceed the category limit. I checked and confirmed that it had been added to the list maintained by Intellihub of installations requiring monitoring, and also confirmed that monitoring had taken place each month.

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 the process and three examples of insufficient load certification.

Audit commentary

Three metering installations were identified in my checks of 58 category 2 certification records which were certified in accordance with the insufficient load clause and required monitoring. I checked and confirmed that all three had been added to the list maintained by Intellihub of installations requiring monitoring, and also confirmed that monitoring had taken place each month. When sufficient load is identified the ATH is provided with profile data to allow them to return at a time when load is available.

Audit outcome

Compliant

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

Code reference

Clause 14(6) of Schedule 10.7

Code related audit information

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

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

Audit observation

I checked three examples of insufficient load and the process to confirm compliance.

Audit commentary

In all three cases sufficient load for certification tests has yet to be identified. Intellihub demonstrated that it understands the requirement to complete testing when sufficient load is identified.

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 five business days, to any requests from the market administrator for additional information,*
- *ensure that all of the details are recorded in the metering installation certification report,*
- *take all steps to ensure that the metering installation is certified before the certification expiry date.*

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

Audit observation

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

Audit commentary

Alternative certification has not been applied to any metering installations.

Audit outcome

Compliant

7.10. Timekeeping Requirements (Clause 23 of Schedule 10.7)

Code reference

Clause 23 of Schedule 10.7

Code related audit information

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

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

Audit observation

I asked Intellihub whether there were any metering installations with time switches.

Audit commentary

Intellihub confirmed there are no metering installations with time switches.

Audit outcome

Compliant

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

Code reference

Clause 35 of Schedule 10.7

Code related audit information

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

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

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

Audit observation

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

Audit commentary

Control device bridging sometimes occurs by contractors on behalf of traders and Intellihub will then be notified in order to conduct remedial action, if the contractor is not operating under an ATH. Notification is not required to any other party because the request comes from the trader. The process is compliant, and I checked 18 examples to confirm compliance and to confirm timeliness.

Audit outcome

Compliant

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

Code reference

Clause 34(5) of Schedule 10.7

Code related audit information

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

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

Audit observation

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

Audit commentary

Intellihub asked all relevant distributors for information on areas with signal propagation issues. Vector responded with some specific areas in the "United" region and Intellihub is ensuring control devices are not installed in these areas. The other responses indicated that no issues were present.

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

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

Audit commentary

No recertification by statistical sampling has taken place in the audit period.

Audit outcome

Compliant

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

Code reference

Clause 24(3) of Schedule 10.7

Code related audit information

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

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

Audit observation

I checked the records for 59 Category 2 metering installations to confirm that compensation factors were correct.

Audit commentary

The compensation factors were correct for all 59 metering installations.

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 100 metering installations to confirm compliance.

Audit commentary

Meters were certified for all 100 installations.

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 the certification records for 27 category 2 metering installations certified using the selected component method to confirm compliance.

Audit commentary

Measuring transformers were certified for all 27 category 2 metering installations certified using the selected component method.

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 94 metering installations containing data storage devices to confirm compliance.

Audit commentary

Data storage devices were certified for all 94 metering installations.

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

I checked the ATH register to confirm compliance.

Audit commentary

All relevant ATHs have appropriate approval.

Audit outcome

Compliant

7.19. Interim Certification (Clause 18 of Schedule 10.7)

Code reference

Clause 18 of Schedule 10.7

Code related audit information

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

Audit observation

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

Audit commentary

There are 560 previously interim certified installations with expired certification.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 7.19 With: Clause 18 of Schedule 10.7 From: 01-Apr-15 To: 22-Apr-21	560 ICPs with expired interim certification. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4		
Audit risk rating	Rationale for audit risk rating		
Medium	I have recorded the controls as moderate in this area because certification has been expired for several years for these ICPs. The impact on settlement is recorded as moderate because of the increased likelihood of failure or inaccuracy for metering installations with expired certification, therefore the audit risk rating is medium.		
Actions taken to resolve the issue		Completion date	Remedial action status
These ICP's are a subset of the approx. 2800 expired ICP's identified in Section 7.19 above, and attempts will have already been made to recertify. As mentioned above, Intellihub has engaged closely with the relevant Traders to attempt to obtain access.		Ongoing	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
As above		Ongoing	

8. INSPECTION OF METERING INSTALLATIONS

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

Code reference

Clause 45 of Schedule 10.7

Code related audit information

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

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

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

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

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

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

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

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

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

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

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

Audit observation

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

Audit commentary

Intellihub conducted category 1 inspections by sample in accordance with this clause. The process and reporting of results is compliant.

Audit outcome

Compliant

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

Code reference

Clause 46(1) of Schedule 10.7

Code related audit information

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

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

Audit observation

I checked the registry information to confirm which ICPs were due for inspection.

Audit commentary

One Category 3 ICP was due for inspection and the inspection was completed within the allowable window.

Audit outcome

Compliant

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

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

Audit commentary

Intellihub checked the relevant details during inspections, and I observed evidence that updates had occurred where discrepancies were found.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

The MEP must make the above arrangements within

- a) 3 business days, if the metering installation is category 3 or higher,*
- b) 10 business days if the metering installation is category 2,*
- c) 20 business days if the metering installation is category 1.*

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

Audit observation

I checked five examples of notification of missing seals.

Audit commentary

In all cases the installation was re-sealed following confirmation that the integrity of the installation was not compromised.

Audit outcome

Compliant

9. PROCESS FOR HANDLING FAULTY METERING INSTALLATIONS

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

Code reference

Clause 10.43(4) and (5)

Code related audit information

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

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

Audit observation

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

Audit commentary

All four examples were metering Category 1 installations where faulty meters were replaced, and the installations recertified. Notification was provided to the traders within 20 business days.

Audit outcome

Compliant

9.2. Testing of Faulty Metering Installations (Clause 10.44)

Code reference

Clause 10.44

Code related audit information

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

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

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

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

Audit observation

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

Audit commentary

All four examples were metering Category 1 installations where faulty meters were replaced, and the installations recertified. The forms completed in the field by the ATHs contain sufficient information to report to relevant parties and meet the requirement for the provision of a statement of situation.

Audit outcome

Compliant

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

Code reference

Clause10.46(2)

Code related audit information

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

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

Audit observation

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

Audit commentary

All four examples were metering Category 1 installations where faulty meters were replaced, and the installations recertified. The forms completed in the field by the ATHs contain sufficient information to report to relevant parties and meet the requirement for the provision of a statement of situation.

Audit outcome

Compliant

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

Code reference

Clause 10.46A

Code related audit information

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

The metering equipment provider must use its best endeavours to complete the remedial action within 10 business days of the date it is required to provide a report to participants under 10.43(4)(c).

Audit observation

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

Audit commentary

All four examples were metering Category 1 installations where faulty meters were replaced, and the installations recertified. In all four examples the recertification was completed within the required timeframe.

Audit outcome

Compliant

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

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

Code reference

Clause 1 of Schedule 10.6

Code related audit information

The MEP must give authorised parties access to raw meter data within 10 business days of receiving the authorised party making a request.

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

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

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

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 2 of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The MEP must within 10 business days of receiving a request from one of the following parties, arrange physical access to each component in a metering installation:

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

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

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 3(5) of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

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

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

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

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

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

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

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

Audit observation

Interrogation cycle

I conducted a walk-through of the process and I checked reporting of meters not read during the maximum interrogation cycle.

Clock synchronisation

Clock synchronisation is discussed in **section 10.7**.

Event logs

Event logs are discussed in **section 10.8**.

Security of raw meter data

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

Audit commentary

Interrogation cycle

Intellihub provided reporting of ICPs where interrogation had not occurred within the maximum interrogation cycle of the meter. 4,279 ICPs were identified in the report. The Intellihub process is to change the AMI Comm flag to “N” for any meter that has not read for 30 or more consecutive days. All 4,279 of the meters identified in the report had the AMI Comm flag changed to “N”. I checked a sample of 25 ICPs from the report which had been changed to “N” during the audit period to determine if the flag had been changed to “N” inside the maximum interrogation cycle of the meter. 22 of the examples checked were changed to AMI “N” inside the maximum interrogation cycle. The time taken to change three of the examples checked to AMI “N” was greater than the maximum interrogation cycle (ICPs 0001448727UN8E8, 0229636004LCA25, 0320980308LC6F4). I have recorded non-compliance as these meters were not read during the maximum interrogation cycle. The new clauses in the Code, effective 1 February 2021, require certification to be cancelled for ICPs not interrogated or changed to AMI Comm “N” inside the maximum interrogation cycle. ICP 0001448727UN8E8 is subject to this clause and certification was cancelled by Intellihub.

Security of raw meter data

With regard to the security of raw meter data, I checked some data from 2017 to confirm it was available. All users have login and password to access working data and only certain IT experts can access raw data. There are no business processes that allow data to be edited. Event data is archived along with consumption data. This part of the process is compliant.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 10.5 With: Clause 8 of Schedule 10.6 From: 01-Jun-20 To: 27-May-21	Some meters not read during the maximum interrogation cycle. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	Rationale for audit risk rating
Low	Strong controls are in place to change the AMI flag to “N” if data cannot be collected. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
<p>On reviewing the 3 examples outlined above, all 3 were identified as having arisen prior to our new process for AMI interrogation failures coming into effect, as described in section 10.12, and on that basis the AMI flag was not updated within the timeframe required by the 1 Feb rule changes.</p> <p>Certification for these ICP's have subsequently been cancelled.</p>	Completed	Cleared
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Intellihub has created a weekly report that identifies meters that have not read within 60% of their MIC and still have the AMI Flag set to Yes. This is a "Safety Net" report which will identify meters that were not captured in the daily (25% or 30 days) AMI Flag process.</p> <p>Intellihub will also run the full MIC (100% of MIC) report on a weekly basis to confirm there are no meters that have reached their full MIC with the AMI still set to No (which would require certification to be cancelled)</p>	June 2021	

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

Code reference

Clause 10.15(2)

Code related audit information

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

Audit observation

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

Audit commentary

With regard to the security of raw meter data, I checked some data from 2017 to confirm it was available. All users have login and password to access working data and only certain IT experts can access raw data. There are no business processes that allow data to be edited. Event data is archived along with consumption data.

Audit outcome

Compliant

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

Code reference

Clause 8(4) of Schedule 10.6

Code related audit information

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

Audit observation

I checked the clock synchronisation processes and reporting for all head ends.

Audit commentary

Intellihub has five different systems. Time synchronisation occurs as follows:

1. Multidrive. The clock setting is five seconds to 30 seconds for Category 1 and five seconds to ten seconds for Category 2. All errors in these bands are adjusted automatically and those over the maximum setting are adjusted manually. This task is conducted daily. If the manual adjustment fails due to a communications issue, then a field visit is booked to fix the issue and synchronise the clock. There is a “repeat offenders” list of installations where the clock has drifted outside the threshold every interrogation. These devices are replaced.
2. Command Centre. The clock setting is ten seconds, so any error less than ten seconds is adjusted automatically and those over ten seconds are adjusted manually. A separate “time synchronisation” report is run on a weekly basis to manage clock errors. Repeat offenders are also monitored and managed.
3. EAMS. This is an RF mesh system, which has “Gatekeepers” and “meters”. Gatekeepers are synchronised to the server on a daily basis. The Gatekeeper time sync setting is two to 25 seconds. Any large time errors over 25 seconds are managed manually. Every 15 minutes the Gatekeepers broadcast a “time sync” signal to the meters and any errors greater than four seconds are adjusted.
4. Silverspring. The clock setting is ten seconds to 20 minutes. For errors over 20 minutes a user must manually set the time.

Intellihub advises affected reconciliation participants of time error adjustments or any potential effect on raw meter data. Intellihub monitors devices with multiple clock errors to ensure the meters are replaced.

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

I checked the most recent reports for each head end, and they contained a total of 80 examples.

Audit outcome

Non-compliant

Non-compliance	Description
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Audit Ref: 10.7 With: Clause 8(4) of Schedule 10.6 From: 01-May-19 To: 31-Mar-20	80 examples of clock errors outside the allowable thresholds in the most recent reports. Potential impact: Medium Actual impact: Low Audit history: Twice Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	I have recorded the controls as strong because clocks are synchronised during every successful interrogation. The impact is considered minor because most clock errors are small and are corrected within one half hour. The audit risk rating is low.		
Actions taken to resolve the issue	Completion date	Remedial action status	
There are no further preventative actions identified that we can reasonably implement.	Completed	Identified	
Preventative actions taken to ensure no further issues will occur	Completion date		
As per above.	Completed		

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 checked the interrogation logs and event logs to ensure the items above were managed in a compliant manner.

Audit commentary

The interrogation logs contain all of the information above. I checked all head ends to confirm this.

Intellihub downloads the event log as required by this clause. All critical events are evaluated, and appropriate action is taken. Relevant events, including tampering, are sent to reconciliation participants. Intellihub provided a table listing all events, which shows “required action”. The list appears to be comprehensive and complete.

I examined the process for filtering and managing events and I confirm that this is complete and robust.

Where Intellihub acts as an agent to other MEPs, those MEPs are required to investigate and manage event information, Intellihub does not conduct this activity for them.

Audit outcome

Compliant

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

Code reference

Clause 8(9) of Schedule 10.6

Code related audit information

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

Audit observation

The sum-check process was examined along with the business rules and associated reporting.

Audit commentary

As recorded in **section 1.1** an exemption came into force on 4th May 2021 and expires on 31 May 2023. Intellihub NZ Limited (“Intellihub”) is exempted from complying with the obligation in clause 8(9) in Schedule 10.6 of the Electricity Industry Participation Code 2010 to ensure that each electronic interrogation of the metering installation that retrieves half hour raw meter data compares the sum of that data against the increment of the metering installation’s accumulating meter registers for the same period for some of their meter types. The meter types have been redacted from the gazette notice. Intellihub applies the same process to all meter types but has applied a higher threshold of 2 kWh for these meter types. Intellihub received a specific instruction from the Authority requiring that the auditor should be advised to confirm compliance with the undertaking during the next audit. My observations in this section apply to all meter types and have taken into account the higher threshold for the specified meter types. I examined recent reporting of sum-check failures for 2,020 meters of which 1,886 were types applicable to the exemption and had differences of between 1 and 2 kWh. I have recorded non-compliance for these meters as the sum check failures occurred before the exemption took effect.

The Code requires additional practices and reporting from 1 February 2021, specifically: If an electronic interrogation is incomplete (missing register or missing intervals), Clause 8(11) of Schedule 10.6 applies, which is the requirement to complete an interrogation within the lesser of 30 days or 25% of the maximum interrogation cycle. If the interrogation is successful before 30 days or 25% of the maximum interrogation cycle, sum-check can be performed for the period the data had been incomplete. For example, if there is a successful interrogation on day 1 but the next successful interrogation (100% complete data including

the register reading), is on day 5, sum-check can occur for a 5-day period. It also seems that if a sum-check is not performed for 30 days or 25% of the maximum interrogation cycle, the AMI flag must be changed to “N”. With the flag set to “N”, certification is not cancelled, because the services access interface changes from remote to local once the flag changes from “Y” to “N”, and this clause only relates to installations where the services access interface is remote.

I observed the Intellihub daily sum check process and checked a report from 30th April 2021 which identified 2,020 meters which had failed sum checks, the report detailed the findings of investigations into the reasons as follows:

Reason for failure	Number
Meter type covered by exemption with failure between 1-2kWh	1,886
High consumption	2
Meter hardware error	1
Midnight timestamp does not match collection date	32
Missing midnight register value	44
Network node registration changed	3
Outage	12
Reading age is within limits	3
Service Current Test Failure	1
Time Changed	27
Voltage event	1
No reason provided	8
Grand Total	2,020

Audit outcome

Non-compliant

Non-compliance	Description
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<p>Audit Ref: 10.9</p> <p>With: Clause 8(9) of Schedule 10.6</p> <p>From: 01-Jun-20</p> <p>To: 27-May-21</p>	<p>1,886 meters failed sum-check prior to exemption coming into effect.</p> <p>Interrogation not successful within 25% of maximum interrogation cycle or 30 days for an unknown number of meters.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: None</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>	
Audit risk rating	Rationale for audit risk rating	
<p>Low</p>	<p>The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement.</p> <p>The impact on settlement and participants is minor; therefore, the audit risk rating is low.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>Intellihub has been granted an exemption to apply a 2-kWh sum check tolerance to some meters within its fleet. The exemption was granted after the 1 February Code changes came into effect, and sum check failures between 1- and 2-kWh occurred for a number of the related meters between 1 February and the date the exemption was granted.</p> <p>The EA have granted a subsequent exemption that allows the Intellihub Class B ATH to perform back office recertification for any meter that is within the scope of the exemption and failed sum check between 1 and 2kWh between 1 February and 5 May. The exemption also sets out that Intellihub must notify the affected Traders where ICPs that they trade on are to be recertified.</p> <p>Intellihub now has a daily sum-check process in place that is compliant with the 1 February rule changes. There was insufficient time for this change to be implemented between the rule changes being announced 15 December 2020 and them taking effect on 1 February 2021. As a result, sum check failures for some meters were not investigated within 3 business days. Intellihub will notify the affected Traders and will work with them to carry out field activity for meter replacements and recertification to resolve this issue.</p>	<p>December 2021</p>	<p>Identified</p>
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Intellihub has implemented a fully compliant and audited daily sum-check process to manage sum check failures in accordance with 1 February EA Code changes and the approved Code exemption.</p>	<p>Completed</p>	

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

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 8(10) of Schedule 10.6

Code related audit information

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

Audit observation

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

Audit commentary

Intellihub is not applying compensation factors to raw meter data.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

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

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

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

Audit observation

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

Audit commentary

I observed the process implemented by Intellihub to meet the new code requirements which require that a successful interrogation must occur within the lesser of 30 days or 25% of the maximum interrogation cycle. A “missing data export” report identifies meters where there are gaps in either the interval or register data. These are followed up to attempt to retrieve the missing data from the meter or update the AMI flag to “N” on the registry or certification is cancelled and a recertification job is created. Whilst the current processes achieve compliance, Intellihub was not able to put the reporting required to achieve compliance in place prior to the 1 February 2021 code changes. I have recorded non-compliance for the period prior to reporting being put in place as Intellihub were unable to identify meters requiring a change of the AMI flag to “N” or cancellation of certification. I was unable to identify the number of meters affected.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 10.12 With: Clause 8(11), 8(12) and 8(13) of Schedule 10.6 From: 01-Feb-21 To: 20-May-21	Reporting and processes not in place to resolve interrogation issues or change the AMI flag to “N” at 25% of the MIC or 30 days. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as strong as reporting had been put in place at the time of the audit. The impact on settlement and participants is minor; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status

<p>Code changes regarding AMI interrogation failures came into effect 1 February 2021. Intellihub had to carry out significant changes to our processes and systems to achieve compliance, and there was not sufficient time available to complete this work before the code changes came into effect. As a result, Intellihub was unable to manage AMI interrogation failures until our implementation of the change was complete.</p>	<p>Completed</p>	<p>Cleared</p>
<p>Preventative actions taken to ensure no further issues will occur</p>	<p>Completion date</p>	
<p>Intellihub has now implemented a compliant daily process to manage AMI Flag updates in accordance with 1st February EA Code changes.</p>	<p>Completed</p>	

CONCLUSION

15 non-compliances were identified, which is an increase of one since the last audit.

Changes to the Code that were announced on 15th December 2020 and implemented on 1st February 2021 have impacted on compliance in five sections of this report. The changes have added new requirements for ATHs in the areas testing, certification of measuring transformers and recording of each available services access interface. The ATHs have not all been able to implement new processes to meet the new requirements which has caused non-compliance for the Intellihub MEP.

Intellihub has implemented new processes and reporting to meet the new requirements as they relate to data collection, particularly the maximum interrogation cycle and sum-check requirements. These changes were not able to be implemented by 1st February 2021.

ATHs have improved their processes in relation to addressing installations with low burden which has led to a reduction in the number of non-compliant installations. But there were still three examples of category 2 installations certified with low burden. I checked a sample of 100 certification reports and found they contained a high number of errors. I have repeated the recommendations from the previous audit to improve controls in relation to the monitoring of ATH practices and records.

The other main areas of non-compliance related to following issues:

- late updating of registry information,
- inaccurate registry information, and
- expired and cancelled certification.

The date of the next audit is determined by the Electricity Authority and is dependent on the level of compliance during this audit. The future risk rating provides some guidance on this matter and recommends an audit frequency of three months. After considering Intellihub's responses to the areas of non-compliance I recommend an audit frequency of nine months.

PARTICIPANT RESPONSE

28 Changes to Part 10 of the Code were announced by the Electricity Authority on 15th December 2020, with an expected implementation date of 1st February 2021. These changes introduced significant impacts on Intellihub and our customers. In the past the Authority has provided advance warning where code changes impact participants significantly. In this instance code changes which had a significant impact on participants were announced with only 27 working days' notice (excluding the Christmas-New Year period). In effect this left insufficient time for Intellihub and ATH's providing services to achieve full compliance prior to code changes taking effect.

Intellihub has responded by taking a pragmatic approach, assigning specific resources and working systematically through the Code changes with the objective of complying in full with all of the new clauses.

The Intellihub MEP is taking steps to ensure that ATHs providing services to Intellihub will correctly record all available services access interfaces within Metering Installation Certification Reports.

Intellihub has successfully implemented reporting to identify exceptions to the check sum tolerance limits, as well as ensuring that Metering Installations which reach 25% of their Maximum Interrogation cycle are updated to AMI = NO.

The Intellihub ATH successfully developed and implemented a burden installation procedure, which is now in use by the majority of ATH's certifying metering installations for the Intellihub MEP. Intellihub agrees with the finding that three ICP's required additional burden. The Intellihub MEP, as well as the Intellihub ATH has taken away important learnings from these three exceptions and will update their work instruction documentation and practices accordingly.

The Intellihub ATH and the Intellihub MEP have jointly implemented a new process for the creation and checking of Metering Installation Certification reports. The objective of this change is to improve efficiency, accuracy and completeness of information.

Intellihub is acutely aware of the requirement to ensure timely updates of Registry information and has a number of initiative underway to improve performance in this area over coming months.