

ELECTRICITY INDUSTRY PARTICIPATION CODE  
MATERIAL CHANGE AUDIT REPORT



For

TRUSTPOWER  
NHH DATA COLLECTION

Prepared by: Steve Woods

Date audit commenced: 5 July 2018

Date audit report completed: 6 July 2018

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## TABLE OF CONTENTS

Executive summary .....	4
Audit summary .....	4
Non-compliances .....	4
Recommendations .....	4
Issues 4	
1. Administrative .....	5
1.1. Exemptions from Obligations to Comply with Code (Section 11) .....	5
1.2. Structure of Organisation .....	5
1.3. Use of Agents (Clause 15.34) .....	5
1.4. Hardware and Software .....	6
1.5. Breaches or Breach Allegations .....	6
1.6. ICP Data .....	6
1.7. Authorisation Received .....	6
1.8. Scope of Audit .....	7
1.9. Summary of previous audit .....	7
2. Operational Infrastructure .....	7
2.1. Relevant information (Clause 10.6, 11.2, 15.2) .....	7
2.2. Provision of information (Clause 15.35) .....	8
2.3. Data transmission (Clause 20 Schedule 15.2) .....	8
2.4. Audit trails (Clause 21 Schedule 15.2) .....	9
2.5. Retailer responsibility for electricity conveyed - participant obligations (Clause 10.4) .....	9
2.6. Retailer responsibility for electricity conveyed - access to metering installations (Clause 10.7(2),(4),(5) and (6)) .....	10
2.7. Physical location of metering installations (Clause 10.35(1)&(2)) .....	10
2.8. Trader contracts to permit assignment by the Authority (Clause 11.15B) .....	10
2.9. Connection of an ICP (Clause 10.32) .....	10
2.10. Temporary Electrical Connection of an ICP (Clause 10.33(1)) .....	10
2.11. Electrical Connection of Point of Connection (Clause 10.33A) .....	10
2.12. Arrangements for line function services (Clause 11.16) .....	10
2.13. Arrangements for metering equipment provision (Clause 10.36) .....	11
3. Maintaining registry information .....	11
4. Performing customer and embedded generator switching .....	11
5. Maintenance of unmetered load .....	11
6. Gathering raw meter data .....	12
6.1. Electricity conveyed & notification by embedded generators (Clause 10.13, Clause 10.24 and 15.13) .....	12
6.2. Responsibility for metering at GIP (Clause 10.26 (6), (7) and (8)) .....	12
6.3. Certification of control devices (Clause 33 Schedule 10.7 and clause 2(2) Schedule 15.3) .....	12
6.4. Reporting of defective metering installations (Clause 10.43(2) and (3)) .....	12
6.5. Collection of information by certified reconciliation participant (Clause 2 Schedule 15.2) .....	12
6.6. Derivation of meter readings (Clause 3(1), 3(2) and 5 Schedule 15.2) .....	13
6.7. NHH meter reading application (Clause 6 Schedule 15.2) .....	15
6.8. Interrogate meters once (Clause 7(1) and (2) Schedule 15.2) .....	15
6.9. NHH meters interrogated annually (Clause 8(1) and (2) Schedule 15.2) .....	16
6.10. NHH meters 90% read rate (Clause 9(1) and (2) Schedule 15.2) .....	16

6.11. NHH meter interrogation log (Clause 10 Schedule 15.2) .....	16
6.12. HHR data collection (Clause 11(1) Schedule 15.2) .....	17
6.13. HHR interrogation data requirement (Clause 11(2) Schedule 15.2) .....	17
6.14. HHR interrogation log requirements (Clause 11(3) Schedule 15.2) .....	17
7. Storing raw meter data .....	18
7.1. Trading period duration (Clause 13 Schedule 15.2) .....	18
7.2. Archiving and storage of raw meter data (Clause 18 Schedule 15.2) .....	18
7.3. Non metering information collected / archived (Clause 21(5) Schedule 15.2) .....	18
8. Creating and managing (including validating, estimating, storing, correcting and archiving) volume information .....	19
8.1. Correction of NHH meter readings (Clause 19(1) Schedule 15.2) .....	19
8.2. Correction of HHR metering information (Clause 19(2) Schedule 15.2) .....	19
8.3. Error and loss compensation arrangements (Clause 19(3) Schedule 15.2) .....	19
8.4. Correction of HHR and NHH raw meter data (Clause 22(1) and (2) Schedule 15.2) .....	20
9. Estimating and validating volume information .....	21
9.1. Identification of readings (Clause 3(3) Schedule 15.2) .....	21
9.2. Derivation of volume information (Clause 3(4) Schedule 15.2) .....	21
9.3. Meter data used to derive volume information (Clause 3(5) Schedule 15.2) .....	22
9.4. Half hour estimates (Clause 15 Schedule 15.2) .....	22
9.5. NHH metering information data validation (Clause 16 Schedule 15.2) .....	22
9.6. Electronic meter readings and estimated readings (Clause 17 Schedule 15.2) .....	23
10. Provision of metering information to the pricing manager in accordance with subpart 4 of Part 13 (clause 15.38(1)(f)) .....	24
11. Provision of submission information for reconciliation .....	24
12. Submission computation .....	24
13. Submission format and timing .....	24
Conclusion .....	25
FCL response .....	26

## EXECUTIVE SUMMARY

**Trustpower Ltd (Trustpower)** intends to start receiving NHH manual meter reading services from Financial Corporation Limited (FCL). Trustpower is in the process of switching in all of the King Country Energy (KCE) ICPs as part of the KCE takeover. FCL has taken over the ex KCE NHH manual meter reading operation, including the Con-X system and all of the personnel. Processes will remain largely the same, but the meter reading rounds and associated meter reading information will be managed in FCL's Orion system and Orion will be the interface between Trustpower's systems and Con-X.

Clause 16A.11 of Part 16 requires that if a participant intends to make a "material" change to any system or process then the changes must be subject to an audit prior to the change taking place. This audit was therefore performed at the request of Trustpower so that it can be supplied to the Electricity Authority to satisfy the requirements of Clause 16A.11(1).

The audit was conducted in accordance with the Guideline for Distributor Audits version 7.2, which was produced by the Electricity Authority.

The systems employed are well established with appropriate functionality, security and audit trails.

One non-compliance was identified, which is the requirement to identify and record phase failure events. FCL intends to provide training in relation to this as part of the next training session.

The go-live date is proposed to be 11/07/18, which will not meet compliance with the requirement to provide the Authority with notification at least five business days prior to go-live.

## AUDIT SUMMARY

### NON-COMPLIANCES

Subject	Section	Clause	Non Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Phase failure	6.6	3(2) of Schedule 15.2	Phase failure events not identified and recorded during meter reading	Moderate	Low	2	Identified
Future Risk Rating						2	

### RECOMMENDATIONS

Subject	Section	Description	Recommendation
		Nil	

### ISSUES

Subject	Section	Description	Issue
		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

Current code exemptions were reviewed on the Electricity Authority website.

#### Audit commentary

There are no exemptions in place relevant to the scope of this audit.

### 1.2. Structure of Organisation

FCL has provided an organisation chart of their structure and Trustpower provided their chart.

Persons involved in this audit

Auditor:

Name	Company
Steve Woods	Veritek Limited

FCL personnel assisting in this audit were:

Name	Title
Barry Barnett	Technical and Compliance Manager, FCL Metering
Keith Ramage	Consultant, FCL Metering

### 1.3. Use of Agents (Clause 15.34)

#### Code reference

*Clause 15.34*

#### Code related audit information

*A reconciliation participant who uses an agent*

- *remains responsible for the contractor's fulfilment of the participant's Code obligations*
- *cannot assert that it is not responsible or liable for the obligation due to something the agent has or has not done*

#### Audit observation

Use of agents was discussed with FCL.

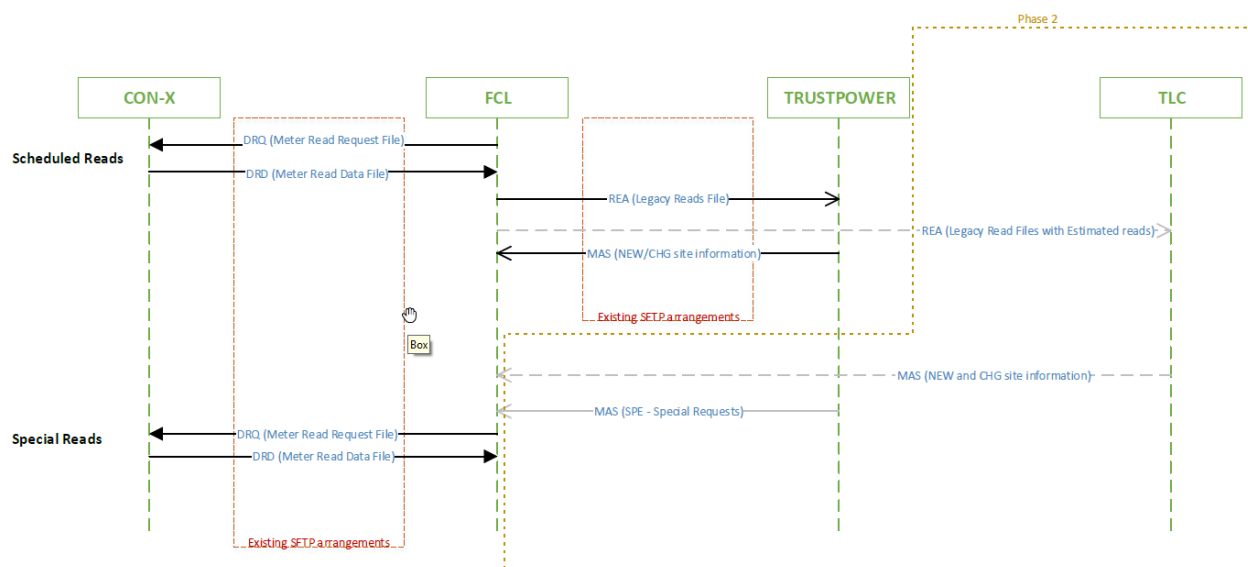
### Audit commentary

FCL is considered an “agent” under clause 15.34 of part 15. Although FCL will manage the meter reading operation, Trustpower will retain responsibility for compliance.

The field service operators used by FCL are employees and sub-contractors in the provision of data collection services.

#### 1.4. Hardware and Software

Manual meter reading is conducted using the Con-X meter reading system. Meter reading rounds are managed within FCL’s Orion system, which interfaces with Con-X and also has an output file which is transferred to Trustpower via SFTP. The diagram below explains these relationships.



Backups occur in accordance with standard industry protocols.

#### 1.5. Breaches or Breach Allegations

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

#### 1.6. ICP Data

FCL will provide meter reading services initially just to Trustpower for approx. 6,000 ICPs.

#### 1.7. Authorisation Received

All information requested was provided directly by FCL.

## 1.8. Scope of Audit

**Trustpower** intends to start receiving NHH manual meter reading services from Financial Corporation Limited (FCL). Trustpower is in the process of switching in all of the King Country Energy (KCE) ICPs as part of the KCE takeover. FCL has taken over the ex KCE NHH manual meter reading operation, including the Con-X system and all of the personnel. Processes will remain largely the same, but the meter reading rounds and associated meter reading information will be managed in FCL's Orion system and Orion will be the interface between Trustpower's systems and Con-X.

The relevant parts of the Code are as follows:

- Clause 15.38 (1) (b) – Gathering and storing NHH raw meter data
- Clause 15.38 (1) (c) (ii) – Creating and managing NHH volume information
- Clause 15.38 (1) (e) – Provision of submission information for reconciliation.

The audit was conducted in accordance with the Guideline for Reconciliation Participant Audits V7.2

The audit was carried out at FCL's premises in Hamilton on 05/07/18.

I checked the Orion system, including the files to and from Trustpower and the files to and from Con-X. I also checked the specification of the systems and interviewed the meter reading supervisor and the consultant engaged to manage the system changes.

## 1.9. Summary of previous audit

This is the first audit of these systems and processes.

# 2. OPERATIONAL INFRASTRUCTURE

## 2.1. Relevant information (Clause 10.6, 11.2, 15.2)

### Code reference

*Clause 10.6, 11.2, 15.2*

### Code related audit information

*A participant must take all practicable steps to ensure that information that the participant is required to provide is:*

- a) complete and accurate*
- b) not misleading or deceptive*
- c) not likely to mislead or deceive.*

*If the participant becomes aware that in providing information under this Part, the participant has not complied with that obligation, the participant must, as soon as practicable, provide such further information as is necessary to ensure that the participant does comply.*

### Audit observation

The process to find and correct incorrect information was examined. The read validation process was examined in detail in relation to the achievement of this requirement.

I checked the following test files to confirm accuracy and compliance:

1. Change file from Trustpower to Orion
2. REA file from Orion to Trustpower with readings and notes
3. DRD files to and from Con-X with meter reading notes and meter readings

### Audit commentary

File checks confirmed the files contained the correct information and were transferred securely. No examples of misleading or incorrect information were identified during any part of the audit.

#### **Audit outcome**

Compliant

### **2.2. Provision of information (Clause 15.35)**

#### **Code reference**

*Clause 15.35*

#### **Code related audit information**

*If an obligation exists to provide information in accordance with Part 15, a participant must deliver that information to the required person within the timeframe specified in the Code, or, in the absence of any such timeframe, within any timeframe notified by the Authority. Such information must be delivered in the format determined from time to time by the Authority.*

#### **Audit observation**

Processes to provide information were reviewed and observed throughout the audit.

#### **Audit commentary**

This area is discussed in a number of sections in this report and compliance is confirmed.

#### **Audit outcome**

Compliant

### **2.3. Data transmission (Clause 20 Schedule 15.2)**

#### **Code reference**

*Clause 20 Schedule 15.2*

#### **Code related audit information**

*Transmissions and transfers of data related to metering information between reconciliation participants or their agents, for the purposes of the Code, must be carried out electronically using systems that ensure the security and integrity of the data transmitted and received.*

#### **Audit observation**

All data is transferred by SFTP.

#### **Audit commentary**

All data is transferred by SFTP.

#### **Audit outcome**

Compliant



## 2.4. Audit trails (Clause 21 Schedule 15.2)

### Code reference

*Clause 21 Schedule 15.2*

### Code related audit information

*Each reconciliation participant must ensure that a complete audit trail exists for all data gathering, validation, and processing functions of the reconciliation participant.*

*The audit trail must include details of information:*

- *provided to and received from the registry manager*
- *provided to and received from the reconciliation manager*
- *provided and received from other reconciliation participants and their agents.*

*The audit trail must cover all archived data in accordance with clause 18.*

*The logs of communications and processing activities must form part of the audit trail, including if automated processes are in operation.*

*Logs must be printed and filed as hard copy or maintained as data files in a secure form, along with other archived information.*

*The logs must include (at a minimum) the following:*

- *an activity identifier (clause 21(4)(a))*
- *the date and time of the activity (clause 21(4)(b))*
- *the operator identifier (clause 21(4)(c)).*

### Audit observation

A complete audit trail was checked for all data gathering, validation and processing functions. I reviewed audit trails for a small sample of events.

I reviewed file transfer logs to confirm that they were compliant.

### Audit commentary

The incoming files from the hand held devices into Dialog are encrypted program database (.pdb) files. These files cannot be edited, and the Dialog system data is read only.

Clause 21 of schedule 15.2 requires that a log of all communication and processing activities will form part of the audit trail. I reviewed data transmission log and confirmed it was compliant.

### Audit outcome

Compliant

## 2.5. Retailer responsibility for electricity conveyed - participant obligations (Clause 10.4)

This will not change as a result of the meter reading project.

### Audit outcome

Not applicable

**2.6. Retailer responsibility for electricity conveyed - access to metering installations (Clause 10.7(2),(4),(5) and (6))**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.7. Physical location of metering installations (Clause 10.35(1)&(2))**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.8. Trader contracts to permit assignment by the Authority (Clause 11.15B)**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.9. Connection of an ICP (Clause 10.32)**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.10. Temporary Electrical Connection of an ICP (Clause 10.33(1))**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.11. Electrical Connection of Point of Connection (Clause 10.33A)**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

**2.12. Arrangements for line function services (Clause 11.16)**

This will not change as a result of the meter reading project.

**Audit outcome**

Not applicable

#### 2.13. Arrangements for metering equipment provision (Clause 10.36)

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

### 3. MAINTAINING REGISTRY INFORMATION

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

### 4. PERFORMING CUSTOMER AND EMBEDDED GENERATOR SWITCHING

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

### 5. MAINTENANCE OF UNMETERED LOAD

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

## 6. GATHERING RAW METER DATA

### 6.1. Electricity conveyed & notification by embedded generators(Clause 10.13, Clause 10.24 and 15.13)

This will not change as a result of the meter reading project.

#### Audit outcome

Not applicable

### 6.2. Responsibility for metering at GIP(Clause 10.26 (6), (7) and (8))

This will not change as a result of the meter reading project.

#### Audit outcome

Not applicable

### 6.3. Certification of control devices (Clause 33 Schedule 10.7 and clause 2(2) Schedule 15.3)

This will not change as a result of the meter reading project.

#### Audit outcome

Not applicable

### 6.4. Reporting of defective metering installations (Clause 10.43(2) and (3))

#### Code reference

*Clause 10.43(2) and (3)*

#### Code related audit information

*If a participant becomes aware of an event or circumstance that lead it to believe a metering installation could be inaccurate, defective, or not fit for purpose they must:*

- *advise the MEP*
- *include in the advice all relevant details.*

#### Audit observation

FCL is not responsible for compliance with this requirement, but does support the compliance of Trustpower by advising them of meters that may be defective. This is discussed further in **section 6.6**.

#### Audit outcome

Compliant

### 6.5. Collection of information by certified reconciliation participant (Clause 2 Schedule 15.2)

#### Code reference

*Clause 2 Schedule 15.2*

#### Code related audit information

*Only a certified reconciliation participant may collect raw meter data, unless only the MEP can interrogate the meter, or the MEP has an arrangement which prevents the reconciliation participant from electronically interrogating the meter:*

*2(2) - The reconciliation participant must collect raw meter data used to determine volume information from the services interface or the metering installation or from the MEP.*

*2(3) - The reconciliation participant must ensure the interrogation cycle is such that it does not exceed the maximum interrogation cycle in the registry .*

*2(4) - The reconciliation participant must interrogate the meter at least once every maximum interrogation cycle.*

*2(5) - When electronically interrogating the meter the participant must:*

- a) ensure the system is to within +/- 5 seconds of NZST or NZDST*
- b) compare the meter time to the system time*
- c) determine the time error of the metering installation*
- d) if the error is less than the maximum permitted error, correct the meter's clock*
- e) if the time error is greater than the maximum permitted error then:*
  - i) correct the metering installation's clock*
  - ii) compare the metering installation's time with the system time*
  - iii) correct any affected raw meter data.*
- f) download the event log.*

*2(6) – The interrogation systems must record:*

- the time*
- the date*
- the extent of any change made to the meter clock.*

#### **Audit observation**

FCL collects raw meter data from the metering installations manually.

Time synchronisation processes for hand held devices were discussed with the meter reading supervisor.

#### **Audit commentary**

All meters are read manually, and FCL does not complete any automated interrogation.

The time in the hand-held devices is synchronised to the server time every 15 minutes if the hand held device is "within range". If the hand held device is not "within range", the synchronisation will occur once communications can be established. The server time is synchronised many times per day to the atomic clock. If a round is completed and the hand-held time is different to the server time this is remedied prior to loading the round.

#### **Audit outcome**

Compliant

### **6.6. Derivation of meter readings (Clause 3(1), 3(2) and 5 Schedule 15.2)**

#### **Code reference**

*Clause 3(1), 3(2) and 5 Schedule 15.2*

#### **Code related audit information**

*All meter readings must in accordance with the participants certified processes and procedures and using its certified facilities be sourced directly from raw meter data and, if appropriate, be derived and calculated from financial records.*

*All validated meter readings must be derived from meter readings.*

*A meter reading provided by a consumer may be used as a validated meter reading only if another set of validated meter readings not provided by the consumer are used during the validation process.*

*During the manual interrogation of each NHH metering installation the reconciliation participant must:*

- a) obtain the meter register*
- b) ensure seals are present and intact*
- c) check for phase failure (if supported by the meter)*
- d) check for signs of tampering and damage*
- e) check for electrically unsafe situations.*

*If the relevant parts of the metering installation are visible and it is safe to do so.*

#### **Audit observation**

I checked the files received by Dialog from the hand held devices, to the files sent to and from Trustpower.

Reporting of meter condition information was reviewed including reviewing information in a sample file to Truspower.

#### **Audit commentary**

During each meter interrogation, FCL collects raw meter data, which is provided to participants to enable compliance with clauses 3(1), 3(2) & 5 of schedule 15.2.

FCL has processes in place to identify and report on tampering, damage, broken and missing seals and unsafe situations. The details are sent in the same file as the meter readings.

Phase failure events are not identified and recorded as required by the Code. FCL intends to conduct training in relation to phase failure during the next training day.

#### **Audit outcome**

Non-compliant

Non-compliance	Description	
Audit Ref: 6.6 With: Clause 3(2) of Schedule 15.2  From: 09-Jul-18 To: 30-Sep-18	Phase failure events not identified and recorded during meter reading Potential impact: Medium Actual impact: Unknown Audit history: None Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
<b>Low</b>	The controls are recorded as moderate because most events are identified and recorded.  The impact on settlement and participants is unknown and could be moderate if any phase failure events are present. I have recorded the audit risk rating as low because the actual impact is unknown.	
Actions taken to resolve the issue		Remedial action status
Trustpower will work with FCLM to provide guidance on suitable training that can be deployed for FCLM meter readers.		Completion date: 31/08/18 Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
Trustpower will work with FCLM to provide guidance on suitable training that can be deployed for FCLM meter readers.	31/08/18	

#### 6.7. NHH meter reading application (Clause 6 Schedule 15.2)

##### Code reference

*Clause 6 Schedule 15.2*

##### Code related audit information

*For NHH switch event meter reads, for the gaining trader the reading applies from 0000 hours on the day of the relevant event date and for the losing trader at 2400 hours at the end of the day before the relevant event date.*

*In all other cases, All NHH readings apply from 0000hrs on the day after the last meter interrogation up to and including 2400hrs on the day of the meter interrogation.*

##### Audit observation

The process of the application of meter readings was examined.

##### Audit commentary

All NHH readings must apply from 0000hrs on the day after the last meter interrogation, up to and including 2400hrs on the day of the meter interrogation.

FCL records the date and time of all meter interrogations. I checked a sample file to confirm this.

##### Audit outcome

Compliant

#### 6.8. Interrogate meters once (Clause 7(1) and (2) Schedule 15.2)

##### Code reference

*Clause 7(1) and (2) Schedule 15.2*

##### Code related audit information

*Each reconciliation participant must ensure that a validated meter reading is obtained in respect of every meter register for every non half hour metered ICP for which the participant is responsible, at least once during the period of supply to the ICP by the reconciliation participant, and used to create volume information.*

*This may be a validated meter reading at the time the ICP is switched to, or from, the reconciliation participant.*

*If exceptional circumstances prevent a reconciliation participant from obtaining the validated meter reading, the reconciliation participant is not required to comply with clause 7(1).*

##### Audit observation

FCL is not responsible for compliance with this requirement, but does support the compliance of Trustpower by obtaining meter readings and providing no read reasons.

### Audit observation

Where a read cannot be obtained, FCL provides a no read code and additional notes if required to explain why the ICP was unread. I reviewed test files and noted that Trustpower will be provided sufficient detail to allow correct reporting of exceptional circumstances.

### New ICP processes

When a new ICP is to be added to a meter reading round, Trustpower will provide FCL with a new file containing the necessary information to allow for sequencing of the ICP and for locating the meter. The information provided should include:

- address
- meter number
- meter location, including meter reading and dog notes if available.

New ICP records are “sequenced” in Orion where the rounds are maintained.

### Do not read process

Trustpower can provide FCL a file when they require them to stop providing readings for an ICP

### Audit outcome

Compliant

## 6.9. NHH meters interrogated annually (Clause 8(1) and (2) Schedule 15.2)

FCL is not responsible for compliance with this requirement, but does support the compliance of participants by attempting to obtain meter readings where it is difficult to obtain readings. This is discussed further in **section 6.8**.

### Audit outcome

Compliant

## 6.10. NHH meters 90% read rate (Clause 9(1) and (2) Schedule 15.2)

FCL is not responsible for compliance with this requirement, but does support the compliance of participants by attempting to obtain meter readings where it is difficult to obtain readings. This is discussed further in **section 6.8**.

### Audit outcome

Compliant

## 6.11. NHH meter interrogation log (Clause 10 Schedule 15.2)

### Code reference

*Clause 10 Schedule 15.2*

### Code related audit information

*The following information must be logged as the result of each interrogation of the NHH metering:*

*10(a) - the means to establish the identity of the individual meter reader*

*10(b) - the ICP identifier of the ICP, and the meter and register identification*



*10(c) - the method being used for the interrogation and the device ID of equipment being used for interrogation of the meter.*

*10(d) - the date and time of the meter interrogation.*

#### **Audit observation**

The data interrogation log requirements were reviewed.

#### **Audit commentary**

The interrogation log contains the following information:

1. field service operator ID
2. identifier of the ICP including meter and register identification
3. the certified reconciliation participant; and
4. date and time.

The method used for interrogation is always the same, and the device ID of equipment being used for interrogation of the meter is recorded.

#### **Audit outcome**

Compliant

#### **6.12. HHR data collection (Clause 11(1) Schedule 15.2)**

FCL does not deal with HHR data.

#### **Audit outcome**

Not applicable

#### **6.13. HHR interrogation data requirement (Clause 11(2) Schedule 15.2)**

FCL does not deal with HHR data.

#### **Audit outcome**

Not applicable

#### **6.14. HHR interrogation log requirements (Clause 11(3) Schedule 15.2)**

FCL does not deal with HHR data.

#### **Audit outcome**

Not applicable

## 7. STORING RAW METER DATA

### 7.1. Trading period duration (Clause 13 Schedule 15.2)

FCL does not deal with HHR data.

#### Audit outcome

Not applicable

### 7.2. Archiving and storage of raw meter data (Clause 18 Schedule 15.2)

#### Code reference

*Clause 18 Schedule 15.2*

#### Code related audit information

*A reconciliation participant who is responsible for interrogating a metering installation must archive all raw meter data and any changes to the raw meter data for at least 48 months, in accordance with clause 8(6) of Schedule 10.6.*

*Procedures must be in place to ensure that raw meter data cannot be accessed by unauthorised personnel.*

*Meter readings cannot be modified without an audit trail being created.*

#### Audit observation

Processes to archive and store raw meter data were reviewed.

#### Audit commentary

All NHH raw meter data will be archived for at least 48 months, as required by clause 8(6)(a) of schedule 10.6.

Password protection is in place to ensure raw meter data cannot be accessed by unauthorised personnel.

When errors are detected during validation of non-half hour meter readings, the meter reading is re-entered as described in **section 9.5**. The most recent reading is sent to the participant, and the original and updated reading is retained. I reviewed the test system to confirm compliance.

#### Audit outcome

Compliant

### 7.3. Non metering information collected / archived (Clause 21(5) Schedule 15.2)

FCL does not collect any non-metering information; compliance was not assessed.

#### Audit outcome

Not applicable

## 8. CREATING AND MANAGING (INCLUDING VALIDATING, ESTIMATING, STORING, CORRECTING AND ARCHIVING) VOLUME INFORMATION

### 8.1. Correction of NHH meter readings (Clause 19(1) Schedule 15.2)

#### Code reference

Clause 19(1) Schedule 15.2

#### Code related audit information

*If errors are detected during validation of non-half hour meter readings, one of the following must be undertaken:*

*19(1)(a) - confirmation of the original meter reading by carrying out another meter reading*

*19(1)(b) - replacement of the original meter reading by another meter reading (even if the replacement meter reading may be at a different date)*

*19(1)(c) - if the original meter reading cannot be confirmed or replaced by a meter reading from another interrogation, then an estimated reading is substituted and the estimated reading is marked as an estimate and it is subsequently replaced in accordance with clause 4(2).*

#### Audit observation

Processes for correction of NHH meter readings were reviewed.

#### Audit commentary

When errors are detected during validation of non-half hour meter readings, the meter reading is re-entered as described in **section 9.5**. Readings are not modified or replaced. The most recent reading is sent to Trustpower and the original and updated reading is retained.

FCL does not provide any estimated readings.

#### Audit outcome

Compliant

### 8.2. Correction of HHR metering information (Clause 19(2) Schedule 15.2)

FCL does not deal with HHR data.

#### Audit outcome

Not applicable

### 8.3. Error and loss compensation arrangements (Clause 19(3) Schedule 15.2)

This will not change as a result of the meter reading project.

#### Audit outcome

Not applicable

#### 8.4. Correction of HHR and NHH raw meter data (Clause 22(1) and (2) Schedule 15.2)

##### Code reference

*Clause 22(1) and (2) Schedule 15.2*

##### Code related audit information

*In correcting a meter reading in accordance with clause 19, the raw meter data must not be overwritten. If the raw meter data and the meter readings are the same, an automatic secure backup of the affected data must be made and archived by the processing or data correction application.*

*If data is corrected or altered, a journal must be generated and archived with the raw meter data file. The journal must contain the following:*

*22(2)(a) - the date of the correction or alteration*

*22(2)(b) - the time of the correction or alteration*

*22(2)(c) - the operator identifier of the reconciliation participant*

*22(2)(d) - the half-hour metering data or the non half hour metering data corrected or altered, and the total difference in volume of such corrected or altered data*

*22(2)(e) - the technique used to arrive at the corrected data*

*22(2)(f) - the reason for the correction or alteration.*

##### Audit observation

Corrections are discussed in **sections 8.1**, which confirmed that raw meter data is not overwritten as part of the correction process.

##### Audit commentary

When errors are detected during validation of non-half hour meter readings, the meter reading is re-entered as described in **section 9.5**. Readings are not modified or replaced.

All readings entered meet the audit trail requirements, which are discussed in **section 2.4**.

##### Audit outcome

Compliant

## 9. ESTIMATING AND VALIDATING VOLUME INFORMATION

### 9.1. Identification of readings (Clause 3(3) Schedule 15.2)

#### Code reference

*Clause 3(3) Schedule 15.2*

#### Code related audit information

*All estimated readings and permanent estimates must be clearly identified as an estimate at source and in any exchange of metering data or volume information between participants.*

#### Audit observation

FCL does not provide estimated readings. All reads are recorded as actual or no reads.

#### Audit commentary

FCL does not provide estimated readings. All reads are recorded as actual or no reads. I checked sample files to confirm compliance.

#### Audit outcome

Compliant

### 9.2. Derivation of volume information (Clause 3(4) Schedule 15.2)

#### Code reference

*Clause 3(4) Schedule 15.2*

#### Code related audit information

*Volume information must be directly derived, in accordance with Schedule 15.2, from:*

*3(4)(a) - validated meter readings*

*3(4)(b) - estimated readings*

*3(4)(c) - permanent estimates.*

#### Audit observation

FCL is not responsible for deriving volume information, but provide validated actual readings which are used to derive volume information.

#### Audit commentary

FCL provides meter readings to Trustpower, which have been subject to a localised validation at hand-held level. Participants use these reads to derive volumes. FCL does not provide estimated readings.

#### Audit outcome

Compliant

### 9.3. Meter data used to derive volume information (Clause 3(5) Schedule 15.2)

#### Code reference

Clause 3(5) Schedule 15.2

#### Code related audit information

*All meter data that is used to derive volume information must not be rounded or truncated from the stored data from the metering installation.*

#### Audit observation

FCL records whole numbers when reading meters.

I checked sample files to confirm compliance.

#### Audit commentary

FCL records whole numbers when reading meters.

I checked sample files to confirm compliance.

#### Audit outcome

Compliant

### 9.4. Half hour estimates (Clause 15 Schedule 15.2)

FCL does not deal with HHR data.

#### Audit outcome

Not applicable

### 9.5. NHH metering information data validation (Clause 16 Schedule 15.2)

#### Code reference

Clause 16 Schedule 15.2

#### Code related audit information

*Each validity check of non half hour meter readings and estimated readings must include the following:*

*16(2)(a) - confirmation that the meter reading or estimated reading relates to the correct ICP, meter, and register*

*16(2)(b) - checks for invalid dates and times*

*16(2)(c) - confirmation that the meter reading or estimated reading lies within an acceptable range compared with the expected pattern, previous pattern, or trend*

*16(2)(d) - confirmation that there is no obvious corruption of the data, including unexpected 0 values.*

#### Audit observation

I reviewed and observed the NHH data validation process, including reviewing read data validation process documentation.

### Audit commentary

FCL completes some data validation on behalf of participants. It is expected that a further level of validation will occur within participants systems, based on consumption history.

FCL's validation processes are described below.

#### ICP and meter number validation

The hand held device stores the ICP and meter register number. The field service operator checks that the meter number is correct before entering the reading, and records an exception if the meter number does not match. This is discussed further in **section 6.6**.

#### Date and time validation

Invalid times and dates are identified through the clock synchronisation process, discussed in **section 6.7**.

#### Validation against expected and historic readings

The hand held data input devices perform a localised validation, to ensure that the reading is within expected high and low parameters when compared to average daily consumption. Average daily consumption is based on the previous three to six reliable reads, or if less than three reads are available, the daily average consumption provided by the retailer is used.

The standard limits are shown in the table below.

Validation Limit	Validation Description
Low low	Last read - 25% of the average consumption for the period.
Low	Last read - 50% of the average consumption for the period.
High	Last read + 100% of the average consumption for the period.
High high	Last read + 200% of the average consumption for the period.

Reads which fail validation must be re-entered. If the re-entered read matches the initial reading it is accepted, if it is different it must be re-entered again before being accepted. If a read fails the "high high" validation the last four digits of the meter number must be entered along with the reading. This ensures the field service operator is at the correct premises.

#### Checks for data corruption including invalid zeros

Zero reads will appear as a low read with code LRE (low read entered). The field service operator can approve the zero read by applying the code ZRC (zero read confirmed) or LRC (low read confirmed).

### Audit outcome

Compliant

#### 9.6. Electronic meter readings and estimated readings (Clause 17 Schedule 15.2)

FCL does not electronically interrogate meters; compliance was not assessed.

### Audit outcome

Not applicable

#### **10. PROVISION OF METERING INFORMATION TO THE PRICING MANAGER IN ACCORDANCE WITH SUBPART 4 OF PART 13 (CLAUSE 15.38(1)(F))**

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

#### **11. PROVISION OF SUBMISSION INFORMATION FOR RECONCILIATION**

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

#### **12. SUBMISSION COMPUTATION**

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable

#### **13. SUBMISSION FORMAT AND TIMING**

This will not change as a result of the meter reading project.

##### **Audit outcome**

Not applicable



## CONCLUSION

The systems employed are well established with appropriate functionality, security and audit trails.

One non-compliance was identified, which is the requirement to identify and record phase failure events. FCL intends to provide training in relation to this as part of the next training session.

## FCL RESPONSE

*FCL Instrument and Electrical Services Ltd (FCL) prides itself not only with delivering the highest standard of data to our clients, but also in ensuring that we do this with a high level of compliance. As always, FCL welcomes the annual NHH Data Collection Audit as, whilst we strive to ensure that all of our processes are robust and compliant, the audit provides us with an independent expert overview. FCL would like to thank Tara and Veritek for conducting this thorough audit and are pleased with the resulting report indicated that there were no recommendations or non-compliances. We look forward to the reporting of continued improvements at our next audit in 2019.*