VERITEK

Electricity Industry Participation Code Audit Report

For

Meridian Energy Limited

NZTA Scanpower Distributed Unmetered Load

Prepared by Tara Gannon – Veritek Ltd

Date of Audit: 29/11/17

Date Audit Report Complete: 01/03/18

Executive Summary

This audit of the NZTA Scanpower DUML database and processes was conducted at the request of Meridian Energy Limited (Meridian), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

Scanpower manages a spreadsheet of NZTA street lights on Scanpower's network. Installation and maintenance work is managed by Tararua District Council, who provide a monthly spreadsheet detailing any lights installed, repaired, or replaced. Scanpower uses this information to update their own spreadsheet.

EMS creates reconciliation submission information on Meridian's behalf using wattages provided by Meridian, and on and off times derived from a data logger read by EMS. Scanpower does not regularly provide their spreadsheet to Meridian. The wattages applied by EMS are based on March 2015 wattage information.

The audit process included a field audit of all items of load, and found 98.9% accuracy. The total difference between the information used for submission and what was present in the field was 0.77 kW, resulting in over reporting of approximately 3,370 kWh per annum. The differences related to incorrect wattages being recorded for all lights, and three lights being recorded with a different make and model to what was present in the field.

The future risk rating of 11 indicates that the next audit be completed in 12 months, and I agree with this recommendation. The matters raised are detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submissions	2.1	11(1) of Schedule 15.3	Incorrect kW information was used to calculate submission information for some months.	Weak	Low	3	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three 27W LED lights were incorrectly recorded as 70W HPS.	Moderate	Low	2	Cleared
Database accuracy	3.1	15.2	41 lamps had incorrect total wattages recorded	Weak	Low	3	Cleared

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2	Incorrect kW information was used to calculate submission information for some months.	Weak	Low	3	Identified
					Future risk rating	11	
					Indicative audit frequency	12 months	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

Table of Recommendations

Subject	Section	Recommendation	Description
		Nil	

Persons Involved in This Audit:

Auditor:

Tara Gannon
Veritek Limited
Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Helen Youngman	Energy Data Analyst	Meridian Energy
Tristan Smiley	Network Engineer (Field Services)	Scanpower

Contents

1. Administrative

1.1 Exemptions from Obligations to Comply With Code (Section 11 of Electricity Industry Act 2010)

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.

Review of current exemptions on the Electricity Authority's website confirmed that there are no exemptions in place relevant to the scope of this audit.

1.2 Supplier List

Scanpower and EMS are considered agents under this clause, and Meridian clearly understands that the use of agents does not release them from their compliance obligations.

The use of agents is not seen as an issue, if the processes for updating the database are robust and have appropriate validation controls in place. This is discussed further in **section 2.6**.

1.3 Hardware and Software

Scanpower records DUML information for community and NZTA lights on their network in an Excel spreadsheet. The spreadsheet is saved on Scanpower's file network, which requires a login and password. All files on the network are backed up nightly.

A new version of the spreadsheet is created whenever a change occurs, and old versions are archived.

1.4 List of ICPs

The following ICP is relevant to the scope of this audit:

ICP	Description	Profile	NSP	No. of items of load
0009104000CAB5C	Transit - SH2 & SH3 Flag Lighting	DST	DVK0111	44

1.5 Breaches or Breach Allegations

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

1.6 Distributed unmetered load audits (Clauses 16A.26 & 17.295F)

Retailers must ensure that DUML database audits are completed:
1. by 1 June 2018 (for DUML that existed prior to 1 June 2017)
2. within three months of submission to the reconciliation manager (for new DUML)

3. within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.

Audit Observation
Meridian have requested Veritek to undertake this streetlight audit.

Audit Commentary
This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe. Compliance is confirmed.

1.7 Separate distributed unmetered load audit (Clause 16A.8(4))

Retailers must ensure that DUML audits are reported in a separate audit report.

Audit Observation
Meridian have requested Veritek to undertake this streetlight audit.

Audit Commentary
The audit report for this DUML database is separate from other audit reports. Compliance is confirmed.

1.8 Summary of Previous Audit

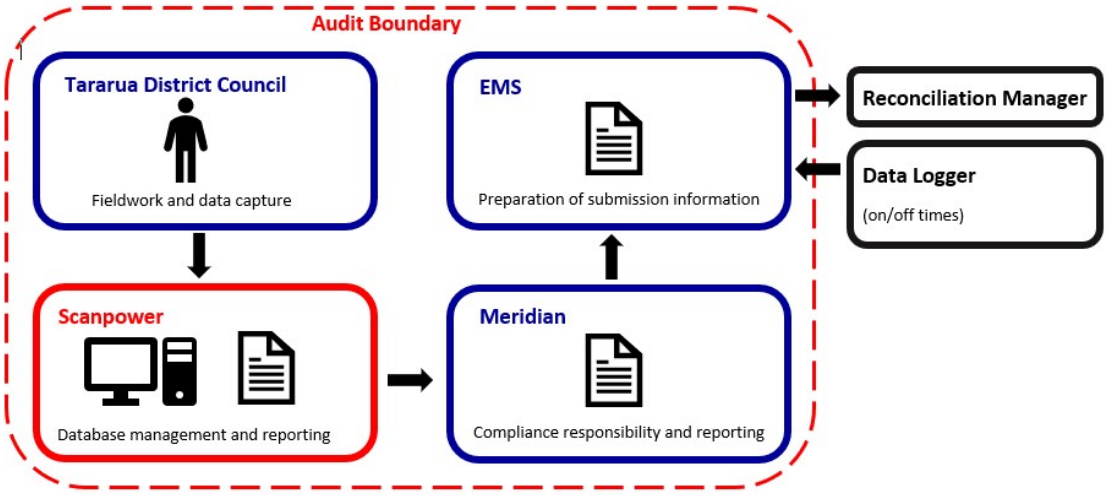
The previous audit conducted in December 2016 was of NZTA's RAMM database. I have since been advised that Scanpower maintains the NZTA street light information for their network. The findings from the previous audit are not relevant to this audit.

1.9 Scope of Audit

Scanpower manages a spreadsheet of NZTA street lights on Scanpower's network. Installation and maintenance work is managed by Tararua District Council, who provide a monthly spreadsheet detailing any lights installed, repaired, or replaced. Scanpower uses this information to update their own spreadsheet.

EMS creates reconciliation submission information on Meridian's behalf using wattages provided by Meridian, and on and off times derived from a data logger read by EMS. Scanpower does not regularly provide their spreadsheet to Meridian. The wattages applied by EMS are based on March 2015 wattage information.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The field audit of all 44 lights in the database was undertaken on 29 November 2017.

1.10 Data Transmission (Clause 20 of Schedule 15.2)

Database information is not regularly reported to Meridian. This is discussed further and recorded as non-compliance in **section 2.1**. Meridian's submissions are based upon historic DUML information from March 2015.

When required by Meridian, Scanpower sends the DUML information via email.

2. DUML database requirements

2.1 Deriving Submission Information (Clause 11(1) of Schedule 15.3)

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit Observation

The process for calculation of consumption was examined.

Audit Commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS, and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for ICP 0009104000CAB5C and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit, and its accuracy and compliance was confirmed.

While the process to calculate the submission information is correct, the capacity report sent to EMS contains the wattage values recorded by Scanpower in March 2015, and is out of date. This is recorded as non-compliance below.

Scanpower's spreadsheet was found to contain some inaccurate data, and this is recorded as non-compliance in **sections 2.5** and **3.1**.

ICP	kW reported to EMS (Mar 15 to Nov 17)	kW in Scanpower's spreadsheet (Nov 17)	kW found in field audit (Nov 17)
0009104000CAB5C	7.17	6.47	6.40

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: entire audit period	Incorrect kW information was used to calculate submission information for some months. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as weak, as they are not sufficient to mitigate the risk of incorrect submissions as the wattage data used is nearly three years old, and out of date. The impact is low, because the difference in kW is small.

Actions taken to resolve the issue	Completion date	Remedial action status
We have sent corrected kW information to our agent and revisions of historic submissions will be undertaken in accordance with the wash up cycle.	Dec 2017	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Scanpower are now providing database information to us monthly so changes can be identified when they occur.	Ongoing	

2.2 ICP Identifier (Clause 11(2)(a) of Schedule 15.3)

The DUML database must contain:
• each ICP identifier for which the retailer is responsible for the DUML
• the items of load associated with the ICP identifier.

Audit Observation

The database was checked to confirm all ICPs were recorded against each item of load.

Audit Commentary

ICP is recorded for all items of load. Compliance is confirmed.

2.3 Location of Each Item of Load (Clause 11(2)(b) of Schedule 15.3)

The DUML database must contain the location of each DUML item.

Audit Observation

The database was checked to confirm the location is recorded for all items of load.

Audit Commentary

Addresses are recorded for all items of load. Compliance is confirmed.

2.4 Description of Load Type (Clause 11(2)(c) & (d) of Schedule 15.3)

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit Observation

The database was checked to confirm that it contained light and gear wattages.

Audit Commentary

The database contains a description of lamp type, and total wattage. Compliance is confirmed.

2.5 All load recorded in database (Clause 11(2A) of Schedule 15.3)

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit Observation

A field audit was undertaken for all 44 lights in the database.

Audit Commentary

The field audit findings are detailed in the table below:

ICP	Database Count	Field Count	Light Count Differences	Light Wattage Differences	Comments
State Highway 2 North of Dannevirke	10	10	-	-	
State Highway 2 South of Dannevirke	29	29	-	-	
State Highway 2 South of Woodville	1	1	-	-	
State Highway 3 West of Woodville	4	4	-	3	3 lights recorded as HPS 70 were found to be LED 27.
Total	**44**	**44**	**-**	**3**	

The three wattage differences are recorded as non-compliance below. Wattage differences where the lamp type was correctly recorded are discussed in **section 3.1**.

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: entire audit period	Three 27W LED lights were incorrectly recorded as 70W HPS. Potential impact: Low Actual impact: None Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate as most lamps were recorded with the correct model information, and there were a small number of discrepancies. The impact is rated as low, because the inaccuracies had no impact on submissions, which were based on old database information. Scanpower promptly updated their database once informed of the discrepancies.

Actions taken to resolve the issue	Completion date	Remedial action status
As reported, the 3 lights with the incorrect lamp type and wattage have been corrected in the database.	Nov 2017	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The discrepancy was caused by updated information being missed for those fittings in the TDC report to Scanpower. We have been advised this is a rare occurrence and unlikely to recur.	Ongoing	

2.6 Tracking of Load Changes (Clause 11(3) of Schedule 15.3)

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit Observation

The process for tracking of changes in the database was examined.

Audit Commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if the database contained an audit trail. I have interpreted this to mean that the production of a monthly "snapshot" report is sufficient to achieve compliance.

Installation and maintenance work is managed by Tararua District Council, who provide a monthly spreadsheet detailing any lights installed, repaired or replaced. Scanpower uses this information to update their spreadsheet.

A monthly check of all lights is completed, to identify any lights that require repairs or maintenance.

Compliance is confirmed.

2.7 Audit Trail (Clause 11(4) of Schedule 15.3)

The DUML database must incorporate an audit trail of all additions and changes that identify:
• the before and after values for changes
• the date and time of the change or addition
• the person who made the addition or change to the database.

Audit Observation
Audit trails were reviewed.

Audit Commentary
A new version of the spreadsheet is created whenever a change occurs, and old versions are archived. I saw evidence of this process in operation. Compliance is confirmed.

3. Accuracy of DUML database

3.1 Database Accuracy (Clause 15.2)

The Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit Observation
The audit findings were used to determine if the information contained in the database is complete and accurate.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

Audit Commentary
The field audit found that all items of load were recorded.

Wattage discrepancies existed for all lights, and three lights were recorded with the incorrect lamp type and wattage. The discrepancies are shown in the table below.

Lamp type	Quantity	Recorded total watts per light	Correct total watts per light	Difference per light
HPS 150	34	165	168	102
LED 80 (86W)	7	88	86	-14
LED 27W recorded as HPS 70W	3	80.1	27	-53.1

The entire database was audited, and database accuracy is estimated to be 98.9% accurate, based recorded database load of 6.47 kW compared to actual load of 6.40 kW.

Scanpower updated their database promptly once informed of the discrepancies.

Non-compliance	Description
Audit Ref: 3.1 With: 15.2 From: entire audit period	41 lamps had incorrect total wattages recorded. Potential impact: Low Actual impact: None Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as weak, as all lamp wattages were recorded incorrectly. The impact is rated as low, because submissions were based off old database information. As some wattages were recorded with values higher than expected, and others with values lower than expected, the impact was reduced. Scanpower promptly updated their database once informed of the discrepancy.

Actions taken to resolve the issue	Completion date	Remedial action status
As reported, the 41 lamps with the incorrect wattage have been corrected in the database.	Nov 2017	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The published standardised table has been made available to Scanpower and should ensure wattages entered in future align with the published table.	Ongoing	

3.2 Volume Information Accuracy (Clause 15.2)

The audit must verify that:

• volume information for the DUML is being calculated accurately

• profiles for DUML have been correctly applied.

Audit Observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that all ICPs have the correct profile and submission flag
- checking the kW information provided to EMS
- confirming the accuracy of EMS' process to calculate volumes.

Audit Commentary

Meridian reconciles this DUML load using the DST profile, and the correct profile and submission flag is recorded on the registry. The on and off times are derived from a data logger read by EMS, and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was

audited during Meridian's reconciliation participant audit, and its accuracy and compliance was confirmed.

The kW volumes provided to EMS were compared to the kW in Scanpower's spreadsheet, and the kW found during the field audit. I found that the total volume submitted to EMS to generate the reconciliation information differed to what was recorded in the field, and what was recorded in the spreadsheet. The differences are shown in the table below, and recorded as non-compliance.

ICP	kW reported to EMS (Mar 15 to Nov 17)	kW in Scanpower's spreadsheet (Nov 17)	kW found in field audit (Nov 17)
0009104000CAB5C	7.17	6.47	6.40

Non-compliance	Description
Audit Ref: 3.1 With: 15.2 From: entire audit period	Incorrect kW information was used to calculate submission information for some months. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as weak. Database changes occur, and without regular reporting submissions will be based on outdated information. The impact is low, the difference between the data used for reporting and actual data is 0.77 kW, resulting in over reporting of approximately 3370 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
We have sent corrected kW information to our agent and revisions of historic submissions will be undertaken in accordance with the wash up cycle.	Dec 2017	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Scanpower are now providing database information to us monthly so changes can be identified when they occur.	Ongoing	

4. Conclusions

Scanpower manages a spreadsheet of NZTA street lights on Scanpower's network. Installation and maintenance work is managed by Tararua District Council, who provide a monthly spreadsheet detailing any lights installed, repaired, or replaced. Scanpower uses this information to update their own spreadsheet.

EMS creates reconciliation submission information on Meridian's behalf using wattages provided by Meridian, and on and off times derived from a data logger read by EMS. Scanpower does not regularly provide their spreadsheet to Meridian. The wattages applied by EMS are based on March 2015 wattage information.

The audit process included a field audit of all items of load, and found 98.9% accuracy. The total difference between the information used for submission and what was present in the field was 0.77 kW, resulting in over reporting of approximately 3,370 kWh per annum. The differences related to incorrect wattages being recorded for all lights, and three lights being recorded with a different make and model to what was present in the field.

The future risk rating of 11 indicates that the next audit be completed in 12 months, and I agree with this recommendation.

Tara Gannon
Veritek Limited
Electricity Authority Approved Auditor

5. Meridian Comments

Meridian has reviewed this report, and their comments are recorded within the non-compliance boxes.