ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

SOUTH WAIKATO DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 21 March 2018

Date audit report completed: 28 May 2018

Audit report due date: 01-Jun-18

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EXECUTIVE SUMMARY

This audit of the South Waikato District Council Unmetered Streetlights (**SWDC**) DUML database and processes was conducted at the request of Genesis Energy Limited (**Genesis**), 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.

Odyssey Energy (2009) Limited (Odyssey) manages the installation, maintenance and database management of all SWDC lighting connections.

SWDC are installing a CMS system and metering this DUML load, therefore this will no longer require an audit as a DUML load which is expected to be by the end of August.

The database contains a small number of ballast discrepancies. These are discussed in the report.

The audit found three non-compliance issues and makes no recommendations. The future risk rating of six indicates that the next audit be completed in 24 months. The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum.	Moderate	Low	2	Identified
Future Risk Rating						6	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Action
		Nil	

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

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

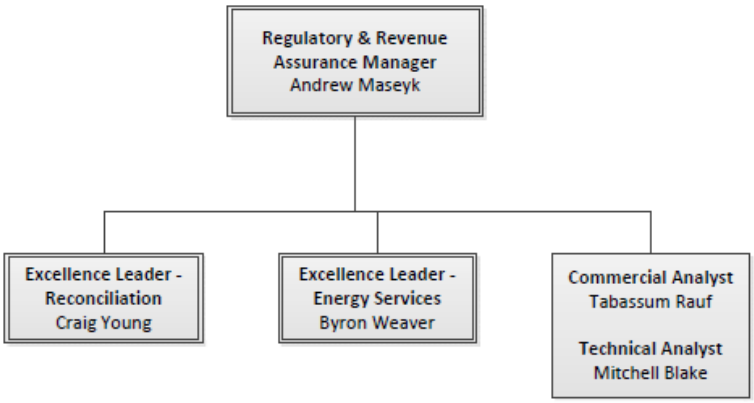
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

Genesis confirms that there are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader- Reconciliation	Genesis Energy
David Raven	Street light Consultant	Odyssey

1.4. Hardware and Software

Section 1.8 Section 1.2 shows that the SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

Database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
1000499769PCCB7	SOUTH WAIKATO STREETLIGHTS, STREETLIGHTS, WAIKATO 2392	HIN0331	NST	897	104,281
1000571665PC2BC	South Waikato District Council Streetlights	KIN0331	NST	1,673	176,616
0000036463HR791	STREETLIGHTING, STATE HIGHWAY 1, ATIAMURI, BAY OF PLENTY	ROT0111	NST	17	3,736

1.7. Authorisation Received

All information was provided directly by Genesis or Odyssey.

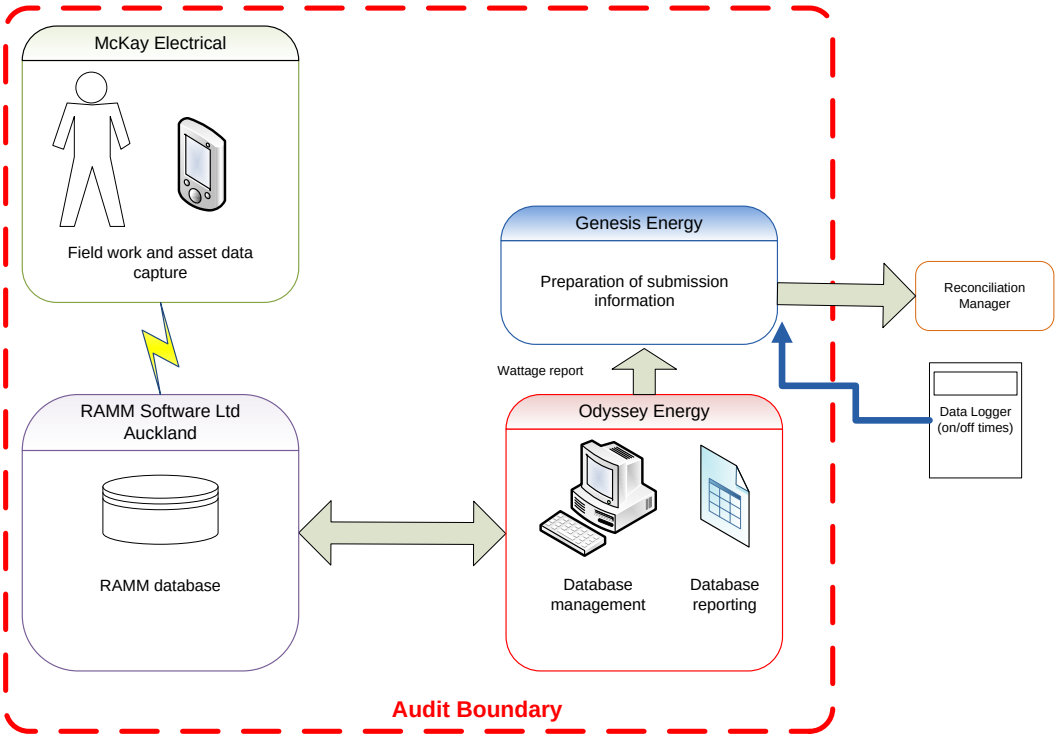
1.8. Scope of Audit

This audit of the South Waikato District Council Unmetered Streetlights (**SWDC**) DUML database and processes was conducted at the request of Genesis Energy Limited (**Genesis**), 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.

The database is remotely hosted by RAMM Software Ltd and is managed by Odyssey, on behalf of SWDC, who is Genesis's customer. McKay Electrical, who is a contractor to Odyssey, and is engaged by SWDC, conducts the fieldwork and asset data capture. Reporting is provided to Genesis on a monthly basis by Odyssey.

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 field audit was undertaken of a statistical sample of 257 items of load on 19th March 2018.

1.9. Summary of previous audit

Genesis provided a copy of the last audit report undertaken by Steve Woods of Veritek Limited in May 2017 this audit report was undertaken for Genesis as part of their 2017 reconciliation participant audit. This audit wasn't submitted due to the audit regime change that occurred on 1st June 2017. For completeness I have included the findings for reference below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
ICP identifier	2.2.1	11(2)(a) of schedule 15.3	At least one additional ICP required on the Powerco network.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for Improvement	Status
			Nil	

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

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

Genesis 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

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

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 and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report from RAMM and the "burn time" which is sourced from a data logger installed on the Powerco network for two of the three ICPs. I checked the methodology used and confirm compliance for these ICPs. The volumes of lights recorded in the monthly wattage report were greater than the volume provided in the monthly report. This suggests that the database extract provided was incomplete and therefore I have not recorded this variance as over submission. In addition to this, the load is being metered in the near future. The registry data is used for ICP 0000036463HR791. The kW value matches that recorded in the database and the methodology was confirmed to be compliant.

There are a small number of inaccurate ballasts being applied within the database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Jun-17 To: 30-Apr-18	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have been working with SWDC to maintain their database. Actions are to introduce led (smart city) infrastructure with a CMS system overlaying measuring usage. Genesis have request AMS metering to be post CMS to capture volumes for billing and settlement.	10/2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested meters which will remove the need for DUML databases.	10/2018	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

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 the correct ICP was recorded against each item of load.

Audit commentary

The RAMM database contains the relevant ICP identifiers for all items of load.

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

The database contains the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for each item of load, and users in the office and field can view these locations on a mapping system.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

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 a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. The gear wattage is recorded in the database which meets the requirements of this clause. I found no blank records. The accuracy of the description and wattages recorded is discussed in **section 3.1.**

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of a statistical sample of 257 items of load on 19th March 2018.

Audit commentary

The field audit findings are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Large Town					
ANNE ST	3	3			
BORONIA ST	8	8			
BRIDGE ST	9	9			
BRIDGE ST (NORTH) CENTRAL	12	12			
CURRIE ST	3	3			
DUNKELD PL	6	6			
GIRVAN PL	4	4			
HAWICK ST	7	7			
HINAU ST	3	3			
MATIPO PL	3	3			
MAYFAIR PL	2	2			
MORVERN CRES	16	16			
O'SULLIVAN DR(SOUTH)	6	6			
PAPANUI ST (NORTH)	16	16			
PARAONUI RD	19	19			
PORRITT PL	2	2			
PRINCESS BEATRIX AVE	12	12			
ROSLIN ST (SOUTH)	9	9			
SWANSTON ST	10	10		1	1x LED found in the field recorded as MH in the database

WEKA PL (A)	1	1			
Main Roads	35	35			
ARAPUNI	21	21			
HUIHUITAHA	2	2			
OVERDALE	8	8			
SH 27	3	3			
WILTSDOWN EAST	1	1			
Small town					
ARAPUNI	18	18			
COUNTY PL	4	4			
HIGH ST (TIRAU)	4	4			
JORDAN PL	1	1			
ROSE ST	6	6			
SEALY CRES	3	3			
Grand Total	**257**	**257**	**Nil**	**1**	

I found no lamp count errors. One lamp wattage difference was found in the field. This is discussed in **section 3.1.**

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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 20th September 2012, the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as 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.

The processes were reviewed for ensuring that changes in the field are notified through to Odyssey. McKay Electrical enters all field data via "Pocket RAMM" directly into RAMM Contractor. Monthly "outage patrols" are conducted, and this process is used to check database accuracy. All McKay Electrical invoices are checked by Odyssey to ensure there is a match between database information and invoice information.

Outage patrols will be in place until SWDC's CMS is in place and the streetlights are metered. This consists of a monthly night time patrol of the network and a six-monthly patrol to pick up any other issues that can't be seen during the night patrols.

There have been no new developments since the last audit and going forward all new streetlights will be connected to metered circuits.

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

The database was checked for audit trails.

Audit commentary

The RAMM database has a complete audit trail of all additions and changes to the database information.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	South Waikato area
Strata	The database contains items of load in South Waikato District Council area. The council area covers two different networks of Powerco and a small number of lights on the Unison network. The processes for the management of are the same across the district but I decided to place the items of load into two strata, as follows: 1. Large towns 2. Small towns.
Area units	I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 31 sub-units.
Total items of load	257 items of load were checked.

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

Audit commentary

The field data was 99.6% of the database data for the sample checked. The total wattage recorded in the database for the sample was 20,617 watts. The estimated total wattage found in the field for the sample checked was 20,552 watts, a difference of 65 watts. This will result in an estimated minor over submission of 450 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

The database was checked and found all ballasts were applied correctly.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Jun-17 To: 30-Apr-18	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have been working with SWDC to maintain their database. Actions are to introduce led (smart city) infrastructure with a CMS system overlaying measuring usage. Genesis have request AMS metering to be post CMS to capture volumes for billing and settlement.	10/2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested meters which will remove the need for DUML databases.	10/2018	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

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 the ICP has the correct profile and submission flag
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report from RAMM and the "burn time" which is sourced from a data logger installed on the Powerco network for two of the three ICPs. I checked the methodology used and confirm compliance for these ICPs. The volumes of lights recorded in the monthly wattage report were greater than the volume provided in the monthly report. This suggests that the database extract provided was incomplete and therefore I have not recorded this variance as over submission. In addition to this, the load is being metered in the near future. The registry data is used for ICP 0000036463HR791. The kW value matches that recorded in the database and the methodology was confirmed to be compliant.

The DUML database auditing tool provided a result indicating the field data was 99.6% of the database data. This will result in an estimated minor over under submission by 450 kWh per annum.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Jun-17 To: 30-Apr-18	The database accuracy is assessed to be 99.6% indicating an estimated minor over submission of 450 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have been working with SWDC to maintain their database. Actions are to introduce led (smart city) infrastructure with a CMS system overlaying measuring usage. Genesis have request AMS metering to be post CMS to capture volumes for billing and settlement.	10/2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested meters which will remove the need for DUML databases.	10/2018	

CONCLUSION

Odyssey Energy (2009) Limited (Odyssey) manages the installation, maintenance and database management of all SWDC lighting connections.

SWDC are installing a CMS system and metering this DUML load, therefore this will no longer require an audit as a DUML load which is expected to be by the end of August.

The database contains a small number of ballast discrepancies. These are discussed in the report.

The audit found three non-compliance issues and makes no recommendations. The future risk rating of six indicates that the next audit be completed in 24 months.

PARTICIPANT RESPONSE

Genesis, POCO and SWDC met to discuss the options they have in regards to DUML. We believe the option to meter strings has been accepted. The need for a database of record should be dismissed upon the implantation of all LED lighting and metering connections. The proposed date of completion was July 2018. No amendments to this date have been received.