ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

OPOTIKI DISTRICT COUNCIL AND GENESIS ENERGY IBN 9429038698279

Prepared by: Rebecca Elliot

Date audit commenced: 26 October 2022

Date audit report completed: 21 February 2023

Audit report due date: 01 March 2023

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the **Opotiki District Council** (**ODC**) 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.

Genesis reconciles this DUML load using the NST profile. The last audit noted that Genesis was not receiving monthly wattage reports. This has been resolved and monthly extracts are being received.

The database accuracy was not found to be within +/-5% accuracy threshold resulting in an estimated 11,800 kWh of under submission per annum. This has increased since the last audit due to new lights being added as part of the infill lighting project that is underway, but not being added to the database. The field audit found 18 additional lights (12.5% error rate). ODC are expecting to install 75 new lights. I repeat the last audits recommend that these are added to the database as they are electrically connected.

This audit found 144 of 176 items of load sampled are labelled as 19.9W lights but are recorded as 19W in the database. Analysis by Steve Woods in 2021 where he compared the metered consumption from the CMS for one 19-watt LED for a 10-day period against a calculation based on the rated wattage (19 watts) * hours (based on CMS on/off times found that the metered consumption was 6.72% higher than the calculated consumption indicated that 19.9W is likely to be correct. In total there are 503 of these lights in the database. This is estimated to be resulting in an under submission of 1,934 kWh per annum.

Genesis continues to use a logger on the Unison network to calculate the burn hours, but this load is on the Horizon network. 75% of the lights are no longer connected to the Horizon network relays anyway and are turned on and off by light sensors as part of the Telensa CMS system so the burn hours will not be accurate. I am unable to determine the correct burn hours so cannot calculate the impact on reconciliation but note this is likely to be more accurate than the 11.7 hours per night that was being used in the last audit. Genesis is working with the ODC to get a "golden" meter installed and a profile so that they can use the output from the CMS to measure the LED light load.

This audit found five non-compliances and repeats three recommendations. The future risk rating of 24 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and that the changes required will take longer than three months to deploy and recommend that the next audit is in nine months time.

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 burn hours used to calculate submission are on a different network and will not reflect the correct burn hours. Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh p.a. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission p.a. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Investigating
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	37 LED lights have make/model as "LED". Make and model information is also required.	Moderate	Low	2	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	18 additional lights found of a sample of 144 lights sampled (12.5% error rate).	Weak	Low	3	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh p.a. 37 LED lights have make/model as "LED". Make and model information is also required. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission p.a. New connections not added to the RAMM database.	Weak	Medium	6	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	The burn hours used to calculate submission are on a different network and will not reflect the correct burn hours. Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh p.a. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission p.a. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Investigating
Future Risk Rating						23	

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

RECOMMENDATIONS

Subject	Section	Recommendation
Deriving submission information	2.1	Liaise with Horizon network to identify a logger.
Database accuracy	3.1	Updates to the database are made as they are electrically connected.
		Genesis to liaise with ODC to confirm additional lights are in the database.

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

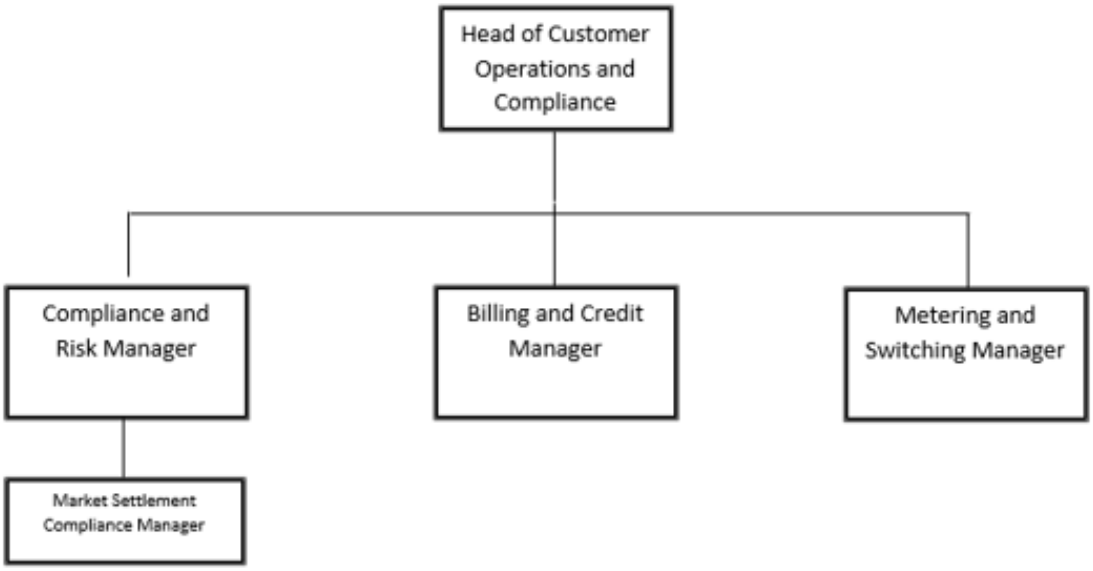
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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
Nirav Teli	DUML Data & Stakeholder Lead	Genesis Energy
Dale Clarke	Transport Engineer	Opotiki DC

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

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

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

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)
1000023038BPAFE	OPOTIKI DISTRICT COUNCIL (Te Kaha)	WAI0501	NST	6	746
1000023040BPDB7	OPOTIKI DISTRICT COUNCIL Rural	WAI0111	NST	185	3,920
1000023041BP1F2	OPOTIKI DISTRICT COUNCIL Urban	WAI0111	NST	437	11,775
Total				644	16,479

1.7. Authorisation Received

All information was provided directly by Genesis and ODC.

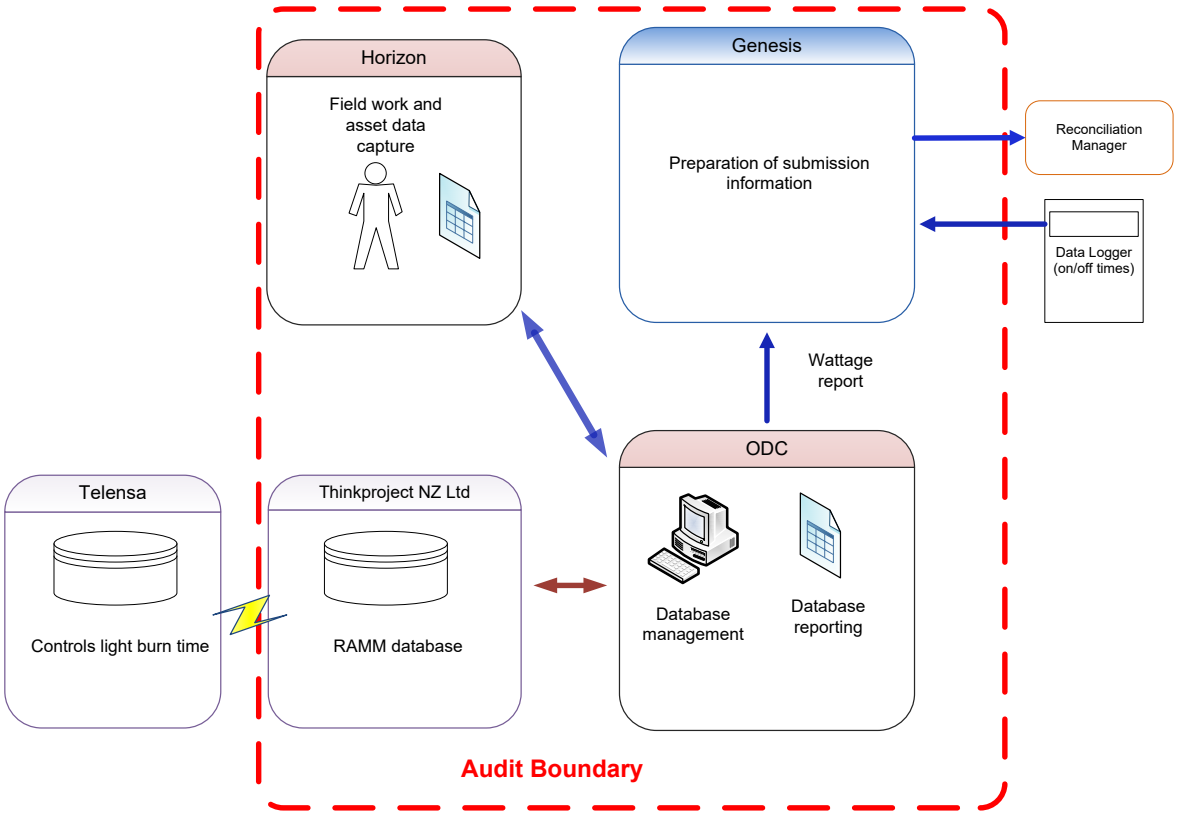
1.8. Scope of Audit

This audit of the Opotiki District Council (ODC) 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. A field audit was undertaken of 176 items of load on 13 December 2022.

Horizon is engaged by ODC to conduct the fieldwork and any changes made are passed back to ODC to update the database. ODC are utilising the same central management system called Telensa as Whakatane DC. It controls the light burn times and has replaced the network relays previously used therefore the fixed burn hours used to calculate submission will not be representative of the actual burn hours.

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.



1.9. Summary of previous audit

I reviewed the last audit report completed by Rebecca Elliot of Veritek Limited in February 2022. Five non-compliances were identified, and three recommendations were made. The statuses of these are detailed below.

Table of Non-compliances

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Submission volumes not accurate as database extracts have not been provided since February 2021 and the burn hours have been used from a different network.	Cleared
			Revisions to correct December 2020 volumes not made resulting in a minor over submission.	Cleared
			Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 4,200 kWh per annum.	Still existing
			The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Still existing
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	39 LED lights have make/model as "LED". Make and model information is also required.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights found of a sample of 195 lights sampled (1% error rate).	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 4,200 kWh per annum.	Still existing
			39 LED lights have make/model as "LED". Make and model information is also required.	
Volume information accuracy	3.2	15.2 and 15.37B(c)	Submission volumes not accurate as database extracts have not been provided since February 2021 and the burn hours have been used from a different network.	Cleared
			Revisions to correct December 2020 volumes not made resulting in a minor over submission.	Cleared
			Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 4,200 kWh per annum.	Still existing

Table of Recommendations

Subject	Section	Non-Compliance	Status
Deriving submission information	2.1	Liaise with Horizon network to identify a logger.	Repeated
Database accuracy	3.1	Updates to the database are made as they are electrically connected.	Repeated
		Genesis to liaise with ODC to confirm additional lights are in the database.	Repeated

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.

Audit outcome

Compliant

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.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The last audit noted that Genesis was not receiving monthly wattage reports. This has been resolved and monthly extracts are being received.

I reviewed the submission for the month of October 2022 and that the values matched.

Genesis have continued to use a logger on the Unison network to calculate the burn hours, but this load is on the Horizon network. As reported in the last audit, 75% of the lights are no longer connected to the Horizon network relays anyway and are turned on and off by light sensors as part of the Telensa CMS system so the burn hours will not be accurate. I am unable to determine the correct burn hours so cannot calculate the impact on reconciliation but note this is likely to be more accurate than the 11.7 hours per night that was being used in the last audit. Genesis is still working with ODC to get a "golden" meter installed and a profile so that they can use the output from the CMS to measure the LED light load. I repeat the last audit's recommend that a data logger be located on the Horizon network for the remaining 25% of lights still be managed by the network's ripple relays.

Description	Recommendation	Audited party comment	Remedial action
Deriving submission information	Liaise with Horizon network to identify a logger.	Genesis has initiated discussions with Horizon and ODC and is exploring available options.	Investigating

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh per annum. This is detailed in **section 3.1**.

This audit found 144 of 176 items of load sampled are labelled as 19.9W lights but are recorded as 19W in the database (similar to the last audit's findings). Analysis by Steve Woods in 2021 where he compared the metered consumption from the CMS for one 19-watt LED for a 10-day period against a calculation based on the rated wattage (19 watts) * hours (based on CMS on/off times found that the metered consumption was 6.72% higher than the calculated consumption indicated that 19.9W is likely to be correct. In total there are 503 of these lights in the database. This is estimated to be resulting in an under submission of 1,934 kWh per annum. This is recorded as non-compliance below.

The current reporting continues to be provided as a snapshot. Once CMS can be used for submission this will resolve this non-compliance for 75% of the load as Telensa measures the kWh load which is recorded at a half hourly basis providing a much higher level of accuracy than has previously been available.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 31-Jan-22 To: 05-Jan-23	The burn hours used to calculate submission are on a different network and will not reflect the correct burn hours. Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh per annum. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak as changes made in the field are not being updated in the database in a timely manner and the burn hours are not being determined accurately. The impact is assessed to be medium based on based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has initiated discussions with Horizon and ODC and is exploring available options regarding loggers. Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified. Genesis has reviewed the auditors finding and have advised ODC of requirement of visibility of tracking of change within their data base and are working with ODC to incorporate this in the dataset	27/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain its database.	27/02/2023	

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 an ICP was recorded against each item of load.

Audit commentary

Each item of load has an ICP recorded against it.

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

All items of load are locatable by nearest house address and GPS coordinates.

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 all items of load were recorded.

Audit commentary

Lamp make, model and lamp wattage are fields in the database. As recorded in the previous audit, examination of the database found that 37 LED lights have make/model as "LED" but make and model information is also required.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 31-Jan-22 To: 05-Jan-23	37 LED lights have make/model as "LED". Make and model information is also required. Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as this information is expected to be captured as part of management of the RAMM database and these are historical. The impact is assessed to be low as this represents a small number of lights.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified.	27/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain its database.	27/02/2023	

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

I conducted a field audit of 176 items of load on 13 December 2022.

Audit commentary

As recorded in the last audit all (144) 19.9W labelled LED lights are recorded in the database of the sample of 176 lights are recorded in the database as 19W. In addition to this I found the following discrepancies.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
BUCHANAN ST	20	23	+2	1	2x additional 19.9W LEDs found in the field. 1x 19.9W LED recorded in the database with zero wattage.
CHATFIELD RD	7	6	-1		1x 19W LED not found in the field
CHURCH/ELLIOTT RAB	5	8	+4 -1	-	2 x double headed 70W HPS recorded as single lights. 2 x additional double headed 70W HPS lights found in the field. 1x 70W HPS not found in the field.
DAWSON DR	1	3	+2		2x additional 19.9W LED found in the field.
DUKE ST	1	2	+2	-	2x additional 19.9W LED found in the field.
EDNA PL	1	2	+1	-	Additional 19.9W LED found in the field.
MOODY PL	5	6	+1		Additional 19.9W LED found in the field.
PETERSEN PL	1	4	+3		3x additional 19.9W LED found in the field.
SEDGWICK RD	11	12	+2 -1		2x additional 19.9W LED found in the field. 1x 19.9W LED not found in the field
TOTAL	**176**	**192**	**21 (+18, -3)**	144	

The field audit found 18 additional lights in the field. This will be due to the infill lighting being installed in the field but not updated in the database. I repeat the last audit's recommendations in **section 3.1**, that these lights are added to the database as they are electrically connected, not as the project is completed.

The database accuracy is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 31-Jan-22 To: 05-Jan-23	18 additional lights found of a sample of 144 lights sampled (12.5% error rate). Potential impact: Medium Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3		
Audit risk rating	**Rationale for audit risk rating**		
Low	The controls are rated as weak as changes made in the field are not being updated in the database in a timely manner. The impact of the missing lights is assessed to be low.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified.		27/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur		**Completion date**	
ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain its database.		27/02/2023	

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

The RAMM database functionality achieves compliance with the code.

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

RAMM contains a complete audit trail of all additions and changes with operator ID 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

A RAMM database extract was provided in October 2022, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Opotiki District Council area
Strata	The database contains the items of load in the Opotiki region. The processes for the management of all ODC items of load are the same, but I decided to place the items of load into three strata: 1. Roads A-C 2. Roads D-P 3. Roads R-W
Area units	I created a pivot table of the roads, and I used a random number generator in a spreadsheet to select a total of 30 sub-units.
Total items of load	176 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority and Veritek, or the manufacturer's specifications.

The change management process and timeliness of database updates was evaluated.

Audit commentary

Database accuracy based on the field audit.

A field audit was conducted of a statistical sample of 176 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	113.7	Wattage from survey is higher than the database wattage by 13.7%
R_L	105.3	With a 95% level of confidence, it can be concluded that the error could be between +5.3% and+28.3%
R_H	128.3	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019 and the table below shows that Scenario B (detailed below) applies.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 5.3% and 28.3% higher than the wattage recorded in the DUML database with statistical significance. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be the 3kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 1 kW and 6 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,800 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 4,500 kWh p.a. to 24,400 kWh p.a. higher than the database indicates.

This will be due to the infill lighting being installed and not updated in the database as detailed below and in **section 2.5**.

Scenario	Description
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Wattage and ballast accuracy findings

Lamp make, model and lamp wattage are fields in the database. As detailed in **section 2.4**, examination of the database found 37 LED lights have make/model as "LED" but make and model information is also required.

This audit found 144 of 176 items of load sampled are labelled as 19.9W lights but are recorded as 19W in the database (similar to the last audit's findings). Analysis by Steve Woods in 2021 where he compared the metered consumption from the CMS for one 19-watt LED for a 10-day period against a calculation based on the rated wattage (19 watts) * hours (based on CMS on/off times found that the metered consumption was 6.72% higher than the calculated consumption indicated that 19.9W is likely to be correct. In total there are 503 of these lights in the database. This is estimated to be resulting in an under submission of 1,934 kWh per annum. This is recorded as non-compliance below.

Change management process findings.

Horizon continues to carry out the field work and provides changes made in the field to ODC to update RAMM. The field audit found 18 additional lights (12.5% of the sample). These are due to the infill lighting being installed in the field that has not been updated in the database leading to under submission. There are expected to be 75 lights installed as part of this project and as noted in the last audit, these are only being updated as the project is completed. This is recorded as non-compliance below and I repeat the last audit's recommendation that the database is updated as the lights are electrically connected.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Updates to the database are made as they are electrically connected.	ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain and update its database.	Investigating

There is some new development occurring in the Opotiki area. As detailed in the last audit, Horizon do request that Genesis accept responsibility for the additional load but there is no process with ODC to confirm that the new lights have been added to the database for the correct electrical connection date. I repeat the last audit's recommendation that this process is reviewed.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Genesis to liaise with ODC to confirm additional lights are in the database.	Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified.	Investigating

Festive lighting is connected into the metered circuits and is therefore accounted for in the metered supply.

No private lights have been identified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 31-Jan-22 To: 05-Jan-23	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh per annum. 37 LED lights have make/model as "LED". Make and model information is also required. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission per annum. New connections not added to the RAMM database. Potential impact: Medium Actual impact: Medium Audit history: Three times previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak as changes made in the field are not being updated in the database in a timely manner. The impact is assessed to be low based on based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified.	27/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain its database.	27/02/2023	

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 all ICPs have the correct profile and submission flag, and
- 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 last audit noted that Genesis was not receiving monthly wattage reports. This has been resolved and monthly extracts are being received.

I reviewed the submission for the month of October 2022 and that the values matched.

Genesis have continued to use a logger on the Unison network to calculate the burn hours, but this load is on the Horizon network. As reported in the last audit, 75% of the lights are no longer connected to the Horizon network relays anyway and are turned on and off by light sensors as part of the Telensa CMS system so the burn hours will not be accurate. I am unable to determine the correct burn hours so cannot calculate the impact on reconciliation but note this is likely to be more accurate than the 11.7 hours per night that was being used in the last audit. Genesis is still working with ODC to get a "golden" meter installed and a profile so that they can use the output from the CMS to measure the LED light load. I repeat the last audit's recommend in **section 2.1**, that a data logger be located on the Horizon network for the remaining 25% of lights still be managed by the network's ripple relays.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh per annum. This is detailed in **section 3.1**.

This audit found 144 of 176 items of load sampled are labelled as 19.9W lights but are recorded as 19W in the database (similar to the last audit's findings). Analysis by Steve Woods in 2021 where he compared the metered consumption from the CMS for one 19-watt LED for a 10-day period against a calculation based on the rated wattage (19 watts) * hours (based on CMS on/off times found that the metered consumption was 6.72% higher than the calculated consumption indicated that 19.9W is likely to be correct. In total there are 503 of these lights in the database. This is estimated to be resulting in an under submission of 1,934 kWh per annum. This is recorded as non-compliance below.

The current reporting continues to be provided as a snapshot. Once CMS can be used for submission this will resolve this non-compliance for 75% of the load as Telensa measures the kWh load which is recorded at a half hourly basis providing a much higher level of accuracy than has previously been available.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 31-Jan-22 To: 05-Jan-23	The burn hours used to calculate submission are on a different network and will not reflect the correct burn hours. Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,800 kWh per annum. 503 lights recorded as 19W but are labelled as 19.9W in the field. Analysis indicates that this is potentially resulting in 1,934 kWh of under submission per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Weak Breach risk rating: 6

Audit risk rating	Rationale for audit risk rating
Medium	The controls are rated as weak as changes made in the field are not being updated in the database in a timely manner and the burn hours are not being determined accurately. The impact is assessed to be medium based on based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has initiated discussions with Horizon and ODC and is exploring available options regarding loggers. Genesis has reviewed the auditors finding and have advised ODC of the discrepancy with the intent that ODC makes every effort to ensure the exceptions are rectified. Genesis has reviewed the auditors finding and have advised ODC of requirement of visibility of tracking of change within their data base and are working with ODC to incorporate this in the dataset	27/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
ODC has been notified of the asset discrepancies. Genesis relies on ODC to accurately maintain its database.	27/02/2023	

CONCLUSION

The database accuracy was not found to be within +/-5% accuracy threshold resulting in an estimated 11,800 kWh of under submission per annum. This has increased since the last audit due to new lights being added as part of the infill lighting project that is underway but not being added to the database. The field audit found 18 additional lights (12.5% error rate). ODC are expecting to install 75 new lights. I repeat the last audits recommend that these are added to the database as they are electrically connected.

The last audit found a large number of 19.9W lights recorded as 19W in the database (183 of 195 lights sampled). ODC are yet to confirm which wattage is correct. This is also contributing to the database inaccuracy with 144 of 176 items of load sampled found with the same issue. Analysis by Steve Woods in 2021 where he compared the metered consumption from the CMS for one 19-watt LED for a 10-day period against a calculation based on the rated wattage (19 watts) * hours (based on CMS on/off times found that the metered consumption was 6.72% higher than the calculated consumption indicated that 19.9W is likely to be correct.

Genesis continues to use a logger on the Unison network to calculate the burn hours, but this load is on the Horizon network. 75% of the lights are no longer connected to the Horizon network relays anyway and are turned on and off by light sensors as part of the Telensa CMS system so the burn hours will not be accurate. I am unable to determine the correct burn hours so cannot calculate the impact on reconciliation but note this is likely to be more accurate than the 11.7 hours per night that was being used in the last audit. Genesis is working with the ODC to get a "golden" meter installed and a profile so that they can use the output from the CMS to measure the LED light load.

This audit found five non-compliances and repeats three recommendations. The future risk rating of 24 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and that the changes required will take longer than three months to deploy and recommend that the next audit is in nine months time.

PARTICIPANT RESPONSE

It is Genesis intension to attend to the non-compliances raised in the audit. Genesis has initiated discussions with Horizon and ODC and is exploring available options regarding loggers. Genesis has reviewed the auditors finding and have advised ODC of requirement of visibility of tracking of change within their data base and are working with ODC to incorporate this in the dataset.