ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

SOUTH TARANAKI DISTRICT COUNCIL AND GENESIS ENERGY LIMITED

NZBN: 9429037706609

Prepared by: Tara Gannon

Date audit commenced: 1 March 2024

Date audit report completed: 5 April 2024

Audit report due date: 14 April 2024

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EXECUTIVE SUMMARY

This audit of the **South Taranaki District Council (STDC)** 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.

The database is remotely hosted by **thinkproject New Zealand Ltd (thinkproject)** and is managed by STDC which is a Genesis customer. **NPE Tech** completes new streetlight installations initiated by STDC, maintenance, removals and replacements and captures streetlight data using Pocket RAMM from the field.

New streetlight installations for subdivisions are arranged by developers and connected by approved Powerco contractors. STDC collects the data for new connections from as built plans which is loaded into RAMM when the lights are livened, and validated during a field check.

Genesis submits the DUML load as NHH using the NST profile. On hours are derived using data logger information for all four ICPs. The monthly database extract is provided as a snapshot, supported by a list of changes which are used to determine the daily load. I checked the submission data for January 2024 and confirmed it had been calculated correctly.

STDC has cleared the database accuracy issues identified during the previous audit. Two minor discrepancies relating to two lights which are not connected but were recorded against DUML ICPs, and three lights with some inconsistencies between light and lamp information were found during this audit. STDC will remove the disconnected lights from the database, and investigate and correct the data for the three lights with discrepancies.

The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. The impact of the inaccuracy is low; in absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates.

Four non-compliances were identified, and one recommendation is made. The future risk rating of seven indicates that the next audit be completed in 18 months and I agree with this recommendation.

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 field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these lights in the database may result in over submission of 48W or 205 kWh per annum.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two floodlights were connected to pole 5055 in the playground at Chester Street but the database recorded a 70W SON. One 21W near the corner of Erin Street and Cameron St (pole number 5169) was missing from the database.	Strong	Low	1	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			lights in the database may result in over submission of 48W or 205 kWh per annum.				
Volume information accuracy	3.2	15.2 and 15.37B(c)	The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these lights in the database may result in over submission of 48W or 205 kWh per annum.	Moderate	Low	2	Identified
Future Risk Rating						7	

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	Comment
Investigate discrepancies between the light make, model and wattage information.	3.1	Investigate discrepancies between the light make, model and wattage information for light IDs 13117, 13040 and 13041. Update any incorrect information.	Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.

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

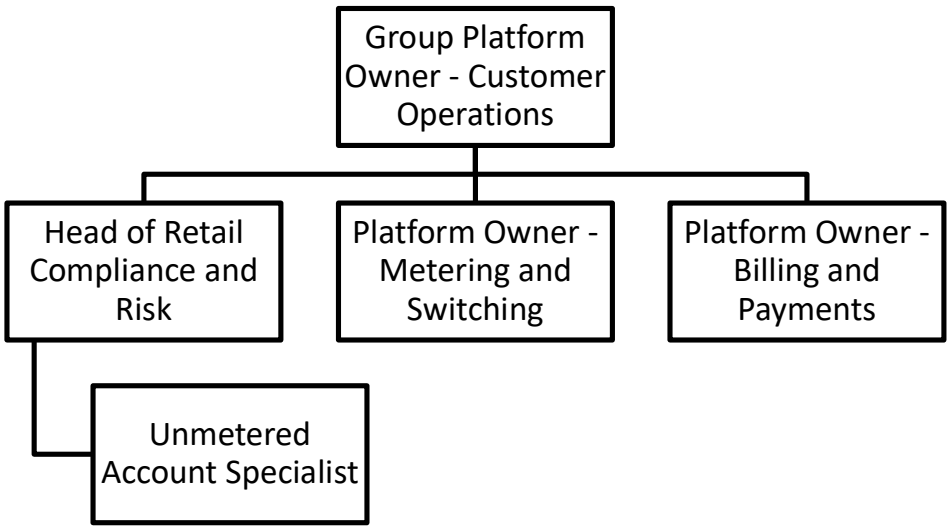
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Genesis provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Role	Company
Tara Gannon	Auditor	Provera

Other personnel assisting in this audit were:

Name	Title	Company
Vincent Lim	Roading Manager	South Taranaki District Council
Mohit Hoda	Engineer	South Taranaki District Council
Alysha Majury	Unmetered Account Specialist	Genesis Energy

1.4. Hardware and Software

RAMM
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.

Genesis systems
Systems used by the Genesis to calculate submissions are assessed as part of their reconciliation participant audit.

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)
1000543526PCDB6	STDC Streetlights WVY0111	WVY0111	NST	368	8,829
1000543527PC1F3	STDC Streetlights HWA0331	HWA0331	NST	1,318	35,919
1000543528PCE2D	STDC Streetlights SFD0331	SFD0331	NST	317	8,509
1000543529PC268	STDC Streetlights OPK0331	OPK0331	NST	297	7,163
			Total	**2,300**	**60,420**

The database also contains lights connected to ICP 0042251397PC0FC cnr Whareroa/Manawapou, which are supplied by MERX.

1.7. Authorisation Received

All information was provided directly by Genesis and STDC.

1.8. Scope of Audit

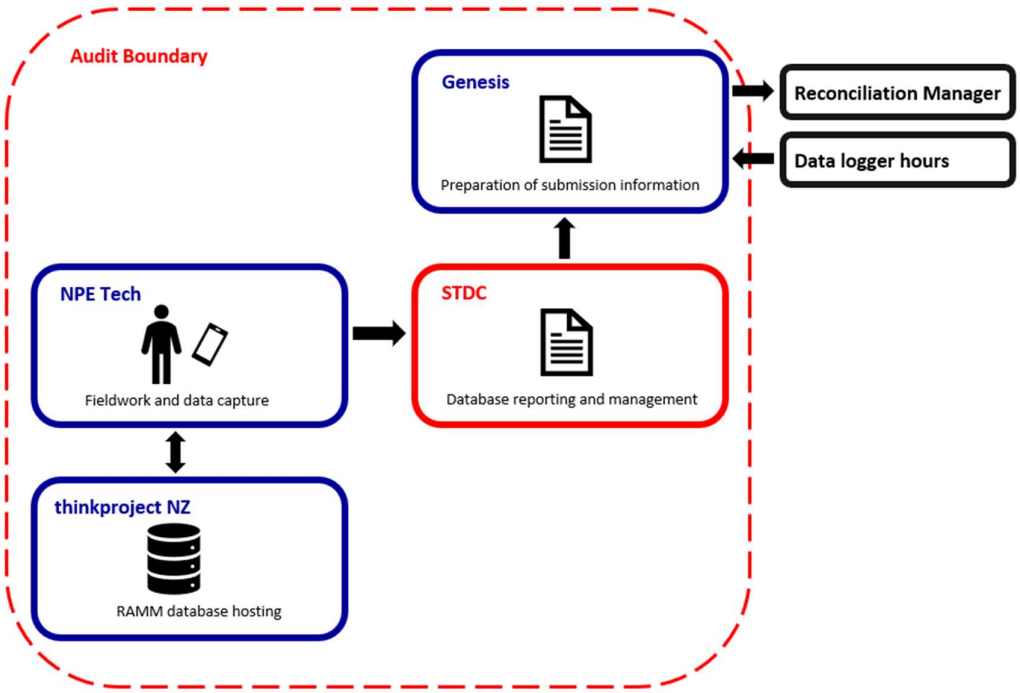
This audit of the STDC DUML database and processes was conducted at the request of Genesis in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The database is remotely hosted by thinkproject and is managed by STDC. NPE Tech completes new streetlight installations initiated by STDC, maintenance, removals and replacements and captures streetlight data using Pocket RAMM from the field.

New streetlight installations for subdivisions are arranged by developers and connected by approved Powerco contractors. STDC collects the data for new connections from "as built" plans which are loaded into RAMM when the lights are livened and validated during a field check.

Genesis submits the DUML load as NHH using the NST profile. On hours are derived using data logger information for all four ICPs. The monthly database extract is provided as a snapshot, supported by a list of changes which are used to determine the daily load. I checked the submission data for January 2024 and confirmed it had been calculated correctly.

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



The field audit was undertaken of a statistical sample of 173 items of load on 10 March 2024.

1.9. Summary of previous audit

The previous audit was completed in June 2023 by Tara Gannon of Provera. Seven non-compliances were identified. The current statuses of the non-compliances are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3)	1. The field audit found that the best available estimate indicates that the database is not accurate within ± 5.0%. There is a 95% level of confidence that the installed capacity is between 3 and 9 kW lower than the database, and the annual consumption is between 12,600 and 39,000 per annum kWh lower than the database indicates. 2. January 2023 kW values were applied when calculating the March 2023 submission because a database extract was not provided in time for submission for March 2023. Use of the January kW values could have resulted in under submission of up to 254.49 kWh for March 2023. 3. Six items of load do not have an ICP number recorded and are expected to have a DUML ICP number assigned, leading to an estimated under submission of 589 kWh per annum. 4. Items of load do not have a gear wattage recorded in the database. 57 items of load are expected to have a non-zero gear wattage applied and adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission. 5. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	1. Still existing. 2. Still existing. Genesis requested database information from STDC but did not receive a report with lamp and gear wattages until June 2023. Because of the delay in receiving the data the original values have remained estimated because it was not possible to determine the correct values for January 2023. 3. Cleared. 4. Cleared. 5. Cleared.
ICP identifier and items of load	2.2	11(2) (a) & (aa) of Schedule 15.3	Six items of load do not have an ICP number recorded.	Cleared.
Location of each item of load	2.3	Clause 11(2)(b) of Schedule 15.3	Two of the 2,295 items of load connected to DUML ICPs do not have sufficient location information recorded to allow them to be readily located.	Cleared.

Subject	Section	Clause	Non-compliance	Status
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Items of load do not have a gear wattage recorded in the database. 57 items of load are expected to have a non-zero gear wattage applied and adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission.	Cleared.
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional Orangetek – TerraLED 21W 4000k (pole number 0243) was found outside Hawera Kindergarten on Kauri Street. One TerraLED 21W 4000k (pole ID 7775) was not recorded in the database with an ICP number and was therefore excluded from the database count for DUML ICPs.	Still existing.
Database accuracy	3.1	15.2 and 15.37B(b)	1. The field audit found that the best available estimate indicates that the database is not accurate within ± 5.0%. There is a 95% level of confidence that the installed capacity is between 3 and 9 kW lower than the database, and the annual consumption is between 12,600 and 39,000 per annum kWh lower than the database indicates. 2. Six items of load do not have an ICP number recorded and are expected to have a DUML ICP number assigned, leading to an estimated under submission of 589 kWh per annum. 3. Items of load do not have a gear wattage recorded in the database. 57 items of load are expected to have a non-zero gear wattage applied and adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission.	1. Still existing. 2. Cleared. 3. Cleared.
Volume information accuracy	3.2	15.2 and 15.37B(c)	1. The field audit found that the best available estimate indicates that the database is not accurate within ± 5.0%. There is a 95% level of confidence that the installed capacity is between 3 and 9 kW lower than the database, and the annual consumption is between	1. Still existing. 2. Still existing. Genesis requested database information from STDC but did not receive a report with lamp and gear wattages until June 2023. Because of the

Subject	Section	Clause	Non-compliance	Status
			12,600 and 39,000 per annum kWh lower than the database indicates. 2. January 2023 kW values were applied when calculating the March 2023 submission because a database extract was not provided in time for submission for March 2023. Use of the January kW values could have resulted in under submission of up to 254.49 kWh for March 2023. 3. Six items of load do not have an ICP number recorded and are expected to have a DUML ICP number assigned, leading to an estimated under submission of 589 kWh per annum. 4. Items of load do not have a gear wattage recorded in the database. 57 items of load are expected to have a non-zero gear wattage applied and adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission. 5. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	delay in receiving the data the original values have remained estimated because it was not possible to determine the correct values for January 2023. 3. Cleared. 4. Cleared. 5. Cleared.

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 Provera 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

Submission data accuracy

Genesis submits the DUML load as NHH using the NST profile. Wattages are derived from an extract provided each month by STDC, and on and off times are derived from a data logger.

I reviewed the submission information for March 2024 and confirmed that it the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information. The current monthly report is provided as a snapshot and STDC provides a report of any changes or replacements during the month so that daily load can be determined.

During the previous audit, I found that the January 2023 kW values were used to estimate the March 2023 kW values because an extract was not received in time for submission. Genesis requested database information from STDC but did not receive a report with lamp and gear wattages until June 2023. Because of the delay in receiving the data the original values have remained estimated, because it was not possible to confirm the correct values for January 2023.

Database accuracy

The database contains some inaccurate information:

Discrepancy	Potential impact on submission
The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates.	Under submission 600 kWh per annum
I found that two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database.	Over submission of 205 kWh per annum

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Jan-24 To: 10-Mar-24	The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these lights in the database may result in over submission of 48W or 205 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Three times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are moderate because the field audit found that the database may not be accurate within ±5%. The impact is low based on the kWh differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis continues to work with the council to ensure accuracy of their datasets.	Continuous	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The council are aware of the findings and it has been highlighted that these 2 lights require to be updated in their database.	Continuous	

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

All items of load have an ICP number recorded.

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 fields for house number, road name, location number, road side and GPS coordinates.

GPS coordinates are recorded for 1,883 (81.8%) of the 2,300 items of load connected to DUML ICPs. 415 of the items of load without GPS coordinates have a road name, house number and/or location number which enables them to be readily located. Two lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected, but are recorded in the database with no house number, location number, or GPS coordinates.

Compliance is recorded in this section because all items of load which should be recorded in the database against DUML ICPs have sufficient address information to enable them to be located. Non-compliance is recorded in **sections 2.1** and **3.1** because the light IDs 12960 and 12961 are not connected and should not be recorded against a DUML ICP.

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 lamp descriptions and capacities.

Audit commentary

Light model, light make, and total wattage are recorded in the database. Total wattage including any applicable gear wattage is recorded in the lamp wattage field. This total wattage value is applied for submission by Genesis.

All items of load have a valid lamp model and valid non-zero wattage recorded. I confirmed that the total wattages for all lights matched the expected values.

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 173 items of load on 10 March 2024. The sample was selected from three strata:

- 1000543526PCDB6, 1000543528PCE2D and 1000543529PC268,
- 1000543527PC1F3 road names A to Kiamarea, and
- 1000543527PC1F3 road names Konini to Z.

Audit commentary

The following differences were identified during the field audit.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
CHESTER ST PATEA	5	5	-	1	One 24W LED (pole ID 5512) was recorded in the database as a 21W LED.
CHESTER ST WAVERLEY	11	12	+1	1	Two floodlights were connected to pole 5055 in the playground at Chester Street but the database recorded a 70W SON.
HADFIELD ST PATEA	7	7	-	2	Two 29W LEDs (pole IDs 4287 and 3811) were recorded in the database as 21W LEDs.
LEICESTER ST PATEA	7	7	-	1	One L34 LED (pole ID 3681) was recorded in the database as a 30W LED.
MEREDITH ST PATEA	4	4	-	1	One 24W LED (pole ID 6652) was recorded in the database as a 21W LED.
NUKUMARU PDE WAITOTARA	9	9	-	2	Two 21W LEDs were recorded in the database as 24W LEDs.
VICTORIA ST PATEA	11	11	-	2	Two 21W LEDs (pole IDs 6623 and 3962) were recorded in the database as 241W LEDs.
BURNS ST HAWERA	9	9	-	1	One 53W LED (pole ID 2679) was recorded in the database as a 21W LED.
CAMERON ST HAWERA	5	6	+1	-	One 21W near the corner of Erin Street and Cameron St (pole number 5169) was missing from the database.
ERIN ST HAWERA	7	7	-	1	One 21W LED (pole ID 2798) was recorded in the database as a 24W LED.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
FINER PL HAWERA	4	3	-1	-	One 70W SON (pole ID 3276) was not found in the field.
KEPA ST OHAWE	3	3	-	1	One 22W LED at the corner of Kepa St and Aperaniko St was recorded in the database as a 24W LED.
Total	**173**	**174**	**1 (-1, +2)**	**13**	

The field audit found two additional items of load found in the field of 173 items of load sampled. This is recorded as non-compliance below. The other database inaccuracies are recorded as non-compliance in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Jan-24 To: 10-Mar-24	Two floodlights were connected to pole 5055 in the playground at Chester Street but the database recorded a 70W SON. One 21W near the corner of Erin Street and Cameron St (pole number 5169) was missing from the database. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are strong. There are adequate processes to ensure that lights are recorded in the database, and two exceptions were identified during the field audit. The impact is low based on the total wattage for the two missing lights.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis continues to work with the council to ensure accuracy of their datasets. The council is aware of the audit findings.	Continuous	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis continues to work with the council to ensure accuracy of their datasets. The council is aware of the audit findings.	Continuous	

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 records audit trail information of changes made.

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 Genesis submissions are based on a monthly extract from the RAMM database. A database extract was provided in January 2024, 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	Streetlights in the South Taranaki region
Strata	The database contains 2,300 items of load located in the South Taranaki region. The management process is the same for all lights. I created three strata by road name: • 1000543526PCDB6, 1000543528PCE2D and 1000543529PC268, • 1000543527PC1F3 road names A to Kiamarea, and • 1000543527PC1F3 road names Konini to Z.
Area units	I created a pivot table of the roads in each stratum, and I used a random number generator in a spreadsheet to select a total of 28 sub-units (roads).
Total items of load	173 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 the manufacturer's specifications.

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 173 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	99.8%	Wattage from survey is lower than the database wattage by 0.2%
R_L	93.4%	With a 95% level of confidence, it can be concluded that the error could be between -6.6% and +2.5%
R_H	102.5%	

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

below) applies, and the best available estimate indicates that the database is not accurate within ± 5.0%.

- In absolute terms, the wattage is estimated to be the same as the database indicates.
- There is a 95% level of confidence that the installed capacity is between 4 kW lower and 1 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 600 kWh per annum lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 17,100 kWh per annum lower and 6,400 per annum kWh higher than the database indicates.

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 accuracy

Light model, light make, and total wattage are recorded in the database. Total wattage including any applicable gear wattage is recorded in the lamp wattage field. This total wattage value is applied for submission by Genesis.

All items of load have a valid lamp model and valid non-zero wattage recorded. I confirmed that the total wattages for all lights matched the expected value based on the lamp model.

Three items of load had a light make and/or model inconsistent with the lamp model and wattage, with a mix of 24W and 21W information. TerraLED 24W lights were STDC's preferred light lamp model but due to supply issues sometimes 21W LEDs were installed instead. Because the 21W version was not recorded as a lamp model in RAMM initially, STDC believes that NPE Tech would sometimes record the lamp information in the light make field for 21W lights, with the intention of updating the details when the lamp model table in RAMM was updated. STDC intends to ask NPE Tech to confirm which light type is installed and update any incorrect light make and model, lamp make and model, and lamp wattage information for the affected lights.

Pole ID	Light ID	Light Make	Light Model	Lamp Model	Lamp Model: Lamp Wattage
6574	13117	21W,Optic P	TerraLED 24W 4000K	TerraLED 24W 4000K	24
7778	13040	21W,Optic P	21W,Optic P	TerraLED 24W 4000K	24
7779	13041	21W,Optic P	21W,Optic P	TerraLED 24W 4000K	24

Recommendation	Description	Audited party comment	Remedial action
Investigate discrepancies between the light make, model and wattage information for light IDs 13117, 13040 and 13041.	Investigate discrepancies between the light make, model and wattage information for light IDs 13117, 13040 and 13041. Update any incorrect information.	Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.	Identified

ICP number accuracy

All items of load have a valid ICP number recorded against them. I found that two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving the lights in the database may result in over submission of 48W or 205 kWh per annum.

Change management process findings

The database is remotely hosted by thinkproject New Zealand Ltd and is managed by STDC. NPE Tech completes new streetlight installations initiated by STDC, maintenance, removals and replacements and captures streetlight data using Pocket RAMM from the field.

New streetlight installations for subdivisions are arranged by developers and connected by approved Powerco contractors. STDC collects the data for new connections from "as built" plans which is loaded into RAMM when the lights are livened and validated by checking the lights in the field.

STDC extracts database information monthly and checks for missing and inaccurate data, particularly where the data has changed within the last month. Exceptions are checked with NPE Tech to confirm the correct values and the database is updated if necessary.

Outage patrols are completed by NPE Tech on a monthly cycle. Outages are also reported by residents within the STDC region and work orders are raised with NPE Tech as required.

STDC's LED upgrade programme is complete. There are still a small number of sodium lights mainly at parks and pedestrian crossings which are expected to be replaced as required during maintenance.

Private lights

All known private lights are metered, and not connected to STDC's streetlight circuits.

Festive Lights

To the best of STDC's knowledge, festive lights are connected to metered under verandah light circuits. When the lights are next installed in November 2024 this will be double checked.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Jan-24 To: 10-Mar-24	The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these lights in the database may result in over submission of 48W or 205 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	Controls are moderate because the field audit found that the database may not be accurate within ±5%. The impact is low based on the kWh differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.	Continuous	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.	Continuous	

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

Submission data was checked for accuracy, including:

- 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

Submission data accuracy and profile application

Genesis submits the DUML load as NHH using the NST profile, and the correct profiles and submission types are recorded on the registry. Wattages are derived from an extract provided each month by STDC, and on and off times are derived from a data logger.

I reviewed the submission information for March 2024 and confirmed that it the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information. The current monthly report is provided as a snapshot and STDC provides a report of any changes or replacements during the month so that daily load can be determined.

During the previous audit, I found that the January 2023 kW values were used to estimate the March 2023 kW values because an extract was not received in time for submission. Genesis requested database information from STDC but did not receive a report with lamp and gear wattages until June 2023. Because of the delay in receiving the data the original values have remained estimated, because it was not possible to confirm the correct values for January 2023.

Database accuracy

The database contains some inaccurate information:

Discrepancy	Potential impact on submission
The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates.	Under submission 600 kWh per annum
I found that two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database.	Over submission of 205 kWh per annum

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Jan-24 To: 10-Mar-24	The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. In absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates. Two 24W lights connected to DUML ICP 1000543528PCE2D (light IDs 12960 and 12961) are not connected and should not be recorded in the database. Leaving these lights in the database may result in over submission of 48W or 205 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are moderate because the field audit found that the database may not be accurate within ±5%. The impact is low based on the kWh differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.	Continuous	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will continue to work with the council to ensure accuracy of their datasets and to ensure these are investigated. The council are also aware of the findings found.	Continuous	

CONCLUSION

STDC has cleared the database accuracy issues identified during the previous audit. Two minor discrepancies relating to two lights which are not connected but were recorded against DUML ICPs, and three lights with some inconsistencies between light and lamp information were found during this audit. STDC will remove the disconnected lights from the database, and investigate and correct the data for the three lights with discrepancies.

The field audit found that the best available estimate indicates that the database is not accurate within ±5.0%. The impact of the inaccuracy is low; in absolute terms, total annual consumption is estimated to be 600 kWh lower than the DUML database indicates.

Four non-compliances were identified, and one recommendation is made. The future risk rating of seven indicates that the next audit be completed in 18 months and I agree with this recommendation.

Participant response

Genesis continues to work with the council to ensure accuracy of their database. We are being provided changes and receiving regular monthly datasets. The council are aware of the findings and are aware of the recommendations.

Genesis agrees with the findings of the audit.