

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: 13 April 2023

Date audit report completed: 24 May 2023

Audit report due date: 14 June 2023

TABLE OF CONTENTS

Executive summary	3
Audit summary	4
Non-compliances	4
Recommendations	7
Issues	8
1. Administrative.....	9
1.1. Exemptions from Obligations to Comply with Code	9
1.2. Structure of Organisation.....	9
1.3. Persons involved in this audit.....	10
1.4. Hardware and Software	10
1.5. Breaches or Breach Allegations.....	10
1.6. ICP Data	10
1.7. Authorisation Received	11
1.8. Scope of Audit	11
1.9. Summary of previous audit	12
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)	13
2. DUML database requirements.....	14
2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)	14
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)	16
2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)	17
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)	18
2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)	20
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3).....	22
2.7. Audit trail (Clause 11(4) of Schedule 15.3).....	22
3. Accuracy of DUML database	23
3.1. Database accuracy (Clause 15.2 and 15.37B(b))	23
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))	26
Conclusion	29
Participant response	29

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 and is managed by STDC, who is Genesis's customer. The fieldwork and asset data capture are conducted by NPE Tech, using Pocket RAMM in the field.

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, and the same kW value is applied for each day of the month when calculating submissions. 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. I compared these values to the database extract received on 13 April 2023 and found that use of the January kW values could have resulted in under submission of up to 254.49 kWh for March 2023. Revised data is expected to be provided through the wash up process once correct values are confirmed.

Based on the field audit of 191 items of load, the best available estimate indicates that the database is not accurate within $\pm 5\%$. 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 p.a. kWh lower than the database indicates. There are a fairly small number of light differences, but several related to higher wattage sodium lights which had not been removed from the database when upgrades occurred.

A small number of other discrepancies were identified during review of the database information and are assessed to have a low impact on submission.

Seven non-compliances were identified, and no recommendations are made. The future risk rating of 18 indicates that the next audit be completed in six months. I have considered this in conjunction with Genesis' comments and recommend that the next audit be in ten 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)	<p>The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$. 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 p.a. kWh lower than the database indicates.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>The data used for submission does not track</p>	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			changes at a daily basis and is provided as a snapshot.				
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.	Moderate	Low	2	Identified
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.	Strong	Low	1	Identified
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.	Moderate	Low	2	Identified
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.	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 $\pm 5.0\%$. 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	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>12,600 and 39,000 p.a. kWh lower than the database indicates.</p> <p>Six items of load do not have an ICP number recorded and are expected to have a DUMI ICP number assigned, leading to an estimated under submission of 589 kWh per annum.</p> <p>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.</p>				
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$. 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 p.a. kWh lower than the database indicates.</p> <p>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.</p> <p>Six items of load do not have an ICP number</p>	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>recorded and are expected to have a DUML ICP number assigned, leading to an estimated under submission of 589 kWh per annum.</p> <p>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.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p>				
Future Risk Rating						18	

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
		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

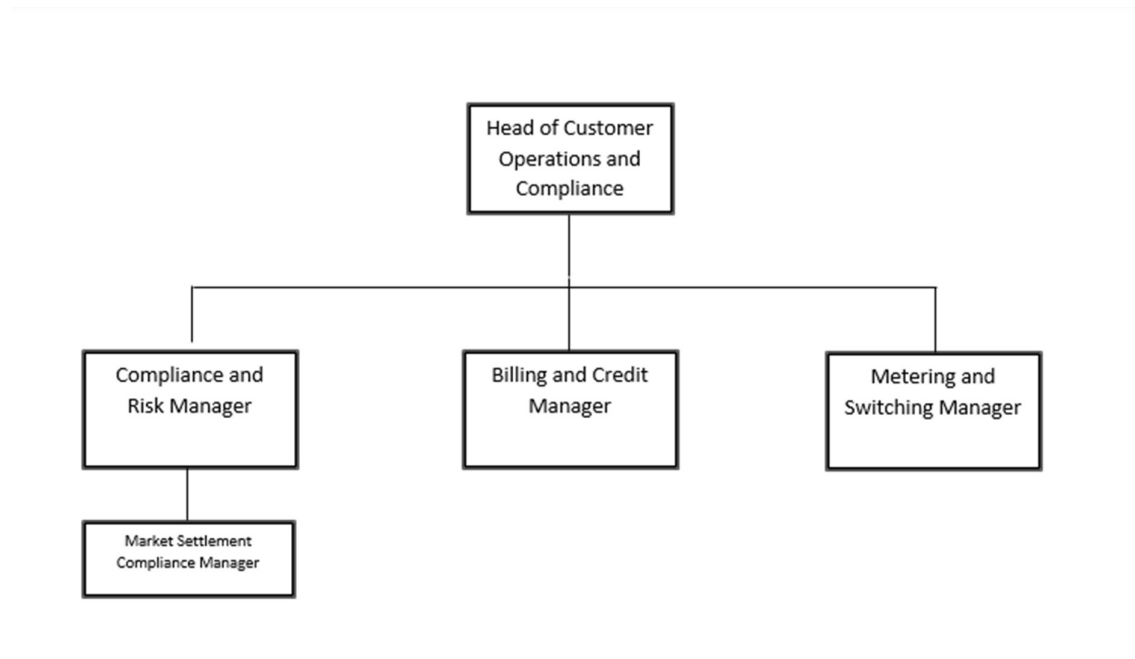
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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	Company	Role
Tara Gannon	Provera	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Vincent Lim	Roading Manager	South Taranaki District Council
Nirav Teli	DUML Data & Stakeholder Lead	Genesis Energy

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.

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)
1000543526PCDB6	STDC Streetlights WVY0111	WVY0111	NST	368	8648
1000543527PC1F3	STDC Streetlights HWA0331	HWA0331	NST	1,315	35,371
1000543528PCE2D	STDC Streetlights SFD0331	SFD0331	NST	315	8,289
1000543529PC268	STDC Streetlights OPK0331	OPK0331	NST	297	7,553
Total				2,295	59,861

The database also contains:

- lights connected to decommissioned ICPs 1000543586PC5A9 South Taranaki District Council NZTA (HAW) and 1000543590PCE8B South Taranaki District Council NZTA (WVY); the lights have been transferred to a separate NZTA database,
- lights connected to ICP 0042251397PC0FC cnr Whareroa/Manawapou, which are supplied by MERX, and
- six lights with a blank ICP number which are expected to have DUMML ICPs assigned; non-compliance is recorded in **sections 2.1** and **2.2**.

1.7. Authorisation Received

All information was provided directly by Genesis and STDC.

1.8. Scope of Audit

This audit of the STDC DUMML 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.

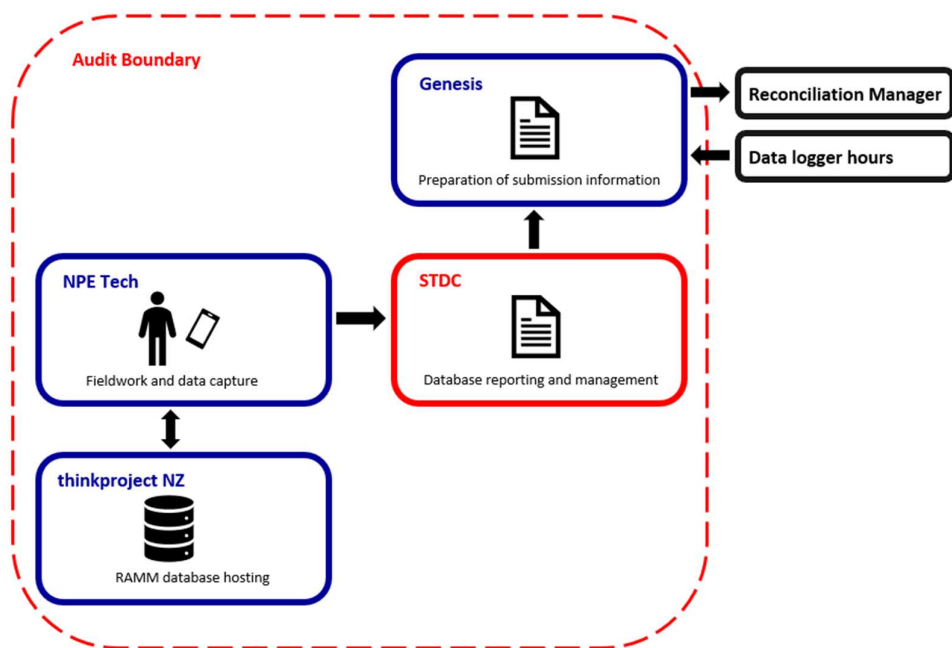
The audit was conducted in accordance with the audit guidelines for DUMML audits version 1.1.

The database is remotely hosted by thinkproject New Zealand Ltd and is managed by STDC, who is Genesis's customer. The fieldwork and asset data capture are conducted by NPE Tech, using Pocket RAMM in the field. 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.

A monthly report from the database is provided to Genesis and used to calculate submissions. Genesis submits the DUMML load as NHH using the NST profile. On hours are derived using data loggers.

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 191 items of load on 4 May 2023.

1.9. Summary of previous audit

The previous audit was completed in May 2023 by Steve Woods of Veritek Limited. Six non-compliances were identified. The statuses of the non-compliances and recommendation are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3)	<ol style="list-style-type: none"> 158 items of load do not have a gear wattage recorded in the database. Adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission. 23 items of load have the incorrect wattage applied in the DUMML database which would result in the minor under submission of 231 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. 	<ol style="list-style-type: none"> Still existing. Cleared. Still existing.
ICP identifier and items of load	2.2	11(2) (a) & (aa) of Schedule 15.3	One item of load with an incorrect ICP recorded.	Cleared. New non-compliance for six lights without ICP numbers.

Subject	Section	Clause	Non-compliance	Status
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	<ol style="list-style-type: none"> 1. Light model is not recorded for 14 lamps. 2. Light model is recorded as 'Unknown' for 17 lamps. 3. Two lamps are recorded as GL 500, wattage indicates should be LED. 4. 158 items of load do not have a gear wattage recorded in the database. Adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission. 	<ol style="list-style-type: none"> 1. Cleared 2. Cleared 3. Cleared 4. Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional items of load found in the field of 220 items of load sampled.	Still existing.
Database accuracy	3.1	15.2 and 15.37B(b)	23 items of load have the incorrect wattage applied in the DUMML database which would result in the minor under submission of 231 kWh per annum.	Cleared, but some new non-compliance has occurred.
Volume information accuracy	3.2	15.2 and 15.37B(c)	<ol style="list-style-type: none"> 1. 158 items of load do not have a gear wattage recorded in the database. Adjusted wattages (including the correct gear wattage) are applied to the monthly extract to RAMM prior to submission. 2. 23 items of load have the incorrect wattage applied in the DUMML database which would result in the minor under submission of 231 kWh per annum. 3. The data used for submission does not track changes at a daily basis and is provided as a snapshot. 	<ol style="list-style-type: none"> 1. Still existing. 2. Cleared. 3. Still existing.

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 DUMML database audits are completed:

1. *by 1 June 2018 (for DUMML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUMML)*
3. *within the timeframe specified by the Authority for DUMML 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

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

I reviewed the submission information for March 2023 and confirmed that the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information.

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. I compared these values to the database extract received on 13 April 2023 and found that use of the January kW values could have resulted in under submission of up to 254.49 kWh for March 2023. Revised data is expected to be provided through the wash up process once correct values are confirmed.

ICP	Genesis March 2023 estimate (based on the January 2023 database extract)	13 April 2023 database extract (adjusted to include gear wattages)	Difference	Difference in kWh for March 2023
1000543526PCDB6	8.459 kW	8.77 kW	0.31 kW	111.95 kWh
1000543527PC1F3	35.199 kW	35.731 kW	0.53 kW	191.50 kWh
1000543529PC268	7.803 kW	7.727 kW	-0.08 kW	-27.36 kWh
1000543528PCE2D	8.515 kW	8.455 kW	-0.06 kW	-21.60 kWh
Total	59.976 kW	60.683 kW	0.71 kW	254.49 kWh

Volume inaccuracy is present as follows:

Discrepancy	Potential impact on submission
The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$.	Under submission of between 12,600 and 39,000 p.a. kWh
Six items of load do not have an ICP number recorded and are expected to have a DUML ICP number assigned.	Under submission of 589 kWh per annum
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	Zero

Discrepancy	Potential impact on submission
wattages (including the correct gear wattage) are applied to the monthly extract from RAMM prior to submission.	

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Genesis calculates the volumes based on the snapshot.

Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 2.1</p> <p>With: Clause 11(1) of Schedule 15.3</p> <p>From: 13-Apr-23</p> <p>To: 04-May-23</p>	<p>The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$. 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 p.a. kWh lower than the database indicates.</p> <p>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.</p> <p>Six items of load do not have an ICP number recorded and are expected to have a DUMML ICP number assigned, leading to an estimated under submission of 589 kWh per annum.</p> <p>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.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Three times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 4</p>
Audit risk rating	Rationale for audit risk rating
Medium	<p>Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time, but there is room for improvement.</p> <p>The impact is assessed to be medium based on the kWh volumes.</p>

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has reviewed the auditors finding and have highlighted these to STDC with the intent that STDC makes every effort to ensure that dataset is sent monthly, accurately maintained and gear wattage is provided.	Continuous Improvement	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis will send monthly reminders to STDC requesting the dataset and will report exceptions identified	Continuous Improvement	

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

Six items of load (138W) have no ICP number recorded. All have “Local Authority” recorded as the light owner. These should have a STDC DUML ICP number recorded against them, and STDC will arrange for the records to be updated.

Road	Road ID	Lamp Model	Pole ID	Light ID	Light Install Date
LONDON STREET	542	TerraLED 24W 4000K	7756	12982	1 December 2016
EGMONT STREET (KAPONGA)	527	TerraLED 21W 4000k	7775	13035	29 September 2022
CAMBRIDGE STREET	710	TerraLED 21W 4000k	7780	13050	21 October 2022
WHITCOMBE ROAD	501	TerraLED 24W 4000K	7789	13068	22 February 2023
CAMERON STREET	574	TerraLED 24W 4000K	7795	13076	21 March 2023
CAMERON STREET	574	TerraLED 24W 4000K	7794	13075	21 March 2023

STDC does check that records are complete; and focusses on changes made within the last month. The database extract was provided on 13 April 2023 and it is expected that the Cameron Street lights installed 21 March 2023 would have been identified and corrected within one month. The other four lights may have been missed in the monthly checks that occurred immediately after they were installed.

The previous audit recorded that one item of load had ICP 1000543527PC1F4 recorded instead of 1000543527PC1F3, and this has been corrected.

Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 13-Apr-23 To: 13-Apr-23	Six items of load do not have an ICP number recorded. Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
Low	The controls are recorded as moderate. There are checks in place for missing ICP numbers which focus on records changed within the last month, but the process could be improved by checking for any lights with missing ICP numbers. The impact on settlement and participants is minor. The lights with missing ICP numbers total 138 W or 589 kWh per annum.	
Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has reviewed the auditors finding and have advised STDC of the discrepancy with the intent that STDC takes every effort to ensure the exceptions are rectified	20/08/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis relies on STDC to accurately maintain its database.	20/08/2023	

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 1,885 (82.1%) of the 2,295 items of load connected to DUMML ICPs. 408 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 items of load connected to DUMML ICPs have a road name, but no house number, location number, or GPS coordinates. STDC will check the lights and add further location information.

Road	ICP group	Road ID	Pole ID	Light ID
CONWAY SH3-LADIES MILE	1000543528PCE2D	522	7732	12960
CONWAY SH3-LADIES MILE	1000543528PCE2D	522	7733	12961

The six items of load with blank ICP numbers have sufficient location information recorded.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.3 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 13-Apr-23 To: 13-Apr-23	Two of the 2,295 items of load connected to DUMML ICPs do not have sufficient location information recorded to allow them to be readily located. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as strong, because two items of load are affected. The impact is low. If lights cannot be located, the accuracy of database records cannot be verified and it may be difficult to identify the correct record to update when maintenance occurs.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has brought this to the attention of STDC with the intent that this gets looked into and accurate information if added in RAMM		20/08/2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis relies on STDC to accurately maintain its database.		20/08/2023	

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 DUMML 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.

Audit commentary

Light model, light make, and lamp wattage are recorded in the database. All items of load have a valid lamp model and valid non-zero lamp wattage recorded. I confirmed that the lamp wattage values for all lights matched the expected values.

The gear wattage field in RAMM is not used by STDC. There are currently 56 high pressure sodium lights and one metal halide light installed, and these are expected to have a non-zero gear wattage. All other lights are LEDs and expected to have a zero gear wattage.

To ensure that correct gear wattage values are applied, STDC maintains a separate table of adjusted wattages including gear wattages which match the expected values for each of the light types. These adjusted wattages are applied to the RAMM report prior to it being sent to Genesis each month.

I compared the database extract, the extract provided to Genesis, and submission data created by Genesis for March 2023; this confirmed that this process is working as intended and the correct adjusted wattages are sent to Genesis and applied for submission.

The six items of load with blank ICP numbers have valid lamp model and wattage information recorded.

Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 2.4</p> <p>With: Clause 11(2)(c) and (d) of Schedule 15.3</p> <p>From: 13-Apr-23</p> <p>To: 13-Apr-23</p>	<p>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.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Three times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>
Audit risk rating	Rationale for audit risk rating
<p>Low</p>	<p>The controls are rated as moderate. Although gear wattages are maintained in a separate table and applied prior to sending the database extract to Genesis, they are not recorded in the database itself.</p> <p>There is no impact on submission because the wattages are corrected to account for gear wattages before the database extract is provided to Genesis each month.</p>

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has brought this to the attention of STDC in May-2023 and again this month with the intent that STDC makes every effort to ensure gear wattage is provided	20/08/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis relies on STDC to accurately maintain its database.	20/08/2023	

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

The field audit was undertaken of a statistical sample of 191 items of load on 4 May 2023. The sample was selected from three strata, as follows:

- 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
1000543526PCDB6, 1000543528PCE2D and 1000543529PC268					
Egmont Street Kaponga	18	19	+1	-	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. This is also recorded as non-compliance in sections 2.1, 2.2, 3.1 and 3.2.
Severn St, Waitotara	3	3	-	1	One Goughline 70W expected to be connected to pole ID 2188 was not found during the field audit. One additional Orangetek – TerraLED 21W 4000k (pole number 0243) was found. This is treated as a wattage difference because the same number of lights were present in the field as in the database.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
1000543527PC1F3 road names A to Kiamarea					
Kauri Crescent, Hawera	3	4	+1	-	One additional Orangetek – TerraLED 21W 4000k (pole number 0243) was found outside Hawera Kindergarten.
1000543527PC1F3 road names Konini to Z					
Ngati Street, Manaia	13	11	-2	-	One Goughlite 100W (pole ID 3342) and one Orangetek – TerraLED 24W 4000k (pole ID 2074) were not found during the field audit.
Regent Street, Hawera	20	19	-1	-	One unknown 100W (pole ID 3725) was not found during the field audit.
Total	191	190	1 (-4, +3)	1	

The field audit found two additional items of load found in the field of 191 items of load sampled. This is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 13-Apr-23 To: 04-May-23	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 DUMI ICPs. 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 rated as strong as the processes in place will ensure that the data is recorded correctly most of the time. The impact is assessed to be low due to the small number of additional lights found in the field in relation to the overall count of the items of load.		
Actions taken to resolve the issue		Completion date	Remedial action status

Genesis has brought this to the attention of STDC with the intent that required action is taken and RAMM gets updated accordingly	20/08/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis relies on STDC to accurately maintain its database.	20/08/2023	

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 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

Genesis' submissions are based on a monthly extract from the RAMM database. A database extract was provided in April 2023, 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 2,295 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: <ul style="list-style-type: none"> • 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 31 sub-units (roads).
Total items of load	191 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 191 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	94.6%	Wattage from survey is lower than the database wattage by 5.4%
R _L	85.0%	With a 95% level of confidence, it can be concluded that the error could be between -15.0% and -4.9%
R _H	95.1%	

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 $\pm 5.0\%$.

- In absolute terms, the wattage is estimated to be 3 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 3 and 9 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 13,900 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 12,600 and 39,000 p.a. kWh lower than the database indicates.

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

Wattage accuracy

The RAMM report containing adjusted wattages was checked against the published standardised wattage table, and manufacturer's specifications where available. My assessment was based on models recorded in the light model field, which determines the wattages recorded and the RAMM extract data provided to Genesis.

Light model, light make, lamp wattage are recorded in the database. All items of load have a valid lamp model and valid non-zero lamp wattage recorded. I confirmed that the lamp wattage values for all lights matched the expected values, and all lamp wattage exceptions identified in the previous audit have been resolved.

The gear wattage field in RAMM is not used by STDC. There are currently 56 high pressure sodium lights and one metal halide light installed, and these are expected to have a non-zero gear wattage. All other lights are LEDs and expected to have a zero-gear wattage.

To ensure that correct gear wattage values are applied, STDC maintains a separate table of adjusted wattages including gear wattages which match the expected values for each of the light types. These adjusted wattages are applied to the RAMM report prior to it being sent to Genesis each month.

The six items of load with blank ICP numbers have valid lamp model and wattage information recorded.

ICP number accuracy

As discussed in **section 2.2**, six items of load (138W) have no ICP number recorded. All have “Local Authority” recorded as the light owner. These should have a STDC DUML ICP number recorded against them, and STDC will arrange for the records to be updated.

Change management process findings

Fault, maintenance, and upgrade work is completed by NPE Tech. Pocket RAMM is used for fieldwork and asset data capture by NPE Tech.

The STDC streetlight team works with the planning team to identify new subdivisions that will have streetlighting and progress with them. NPE Tech are Powerco approved contractors and will normally be responsible for connecting any new streetlighting. The lights are entered into RAMM as soon as they are connected.

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.

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 56 high pressure sodium lights and one metal halide light, which may be replaced in the future when sufficient budget is available.

STDC manage the repair work for NZTA lights, the lights are included in the STDC database for this purpose only. The lights are excluded from the monthly report provided to Genesis.

Private lights

All known private lights are metered.

Festive Lights

All festive lighting is connected to metered under veranda lights and excluded from the database.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)	The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$. 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 p.a. kWh lower than the database indicates. 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. 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. Potential impact: Low Actual impact: Low

From: 13-Apr-23 To: 04-May-23	Audit history: Once Controls: Moderate Breach risk rating: 4		
Audit risk rating	Rationale for audit risk rating		
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be medium based on the kWh volumes.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has reviewed the auditors finding and have highlighted these to STDC with the intent that STDC makes every effort to ensure that dataset is sent monthly, accurately maintained and gear wattage is provided.		Continuous Improvement	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis will send monthly reminders to STDC requesting the dataset and will report exceptions identified		Continuous Improvement	

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

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

I reviewed the submission information for March 2023 and confirmed that the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information.

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. I compared these values to the database extract received on 13 April 2023 and found that use of the January kW values could have resulted in under submission of

up to 254.49 kWh for March 2023. Revised data is expected to be provided through the wash up process once correct values are confirmed.

ICP	Genesis March 2023 estimate (based on the January 2023 database extract)	13 April 2023 database extract (adjusted to include gear wattages)	Difference	Difference in kWh for March 2023
1000543526PCDB6	8.459 kW	8.77 kW	0.31 kW	111.95 kWh
1000543527PC1F3	35.199 kW	35.731 kW	0.53 kW	191.50 kWh
1000543529PC268	7.803 kW	7.727 kW	-0.08 kW	-27.36 kWh
1000543528PCE2D	8.515 kW	8.455 kW	-0.06 kW	-21.60 kWh
Total	59.976 kW	60.683 kW	0.71 kW	254.49 kWh

Volume inaccuracy is present as follows:

Discrepancy	Potential impact on submission
The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$.	Under submission of between 12,600 and 39,000 p.a. kWh
Six items of load do not have an ICP number recorded and are expected to have a DUML ICP number assigned.	Under submission of 589 kWh per annum
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 from RAMM prior to submission.	Zero

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Genesis calculates the volumes based on the snapshot.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 13-Apr-23 To: 04-May-23</p>	<p>The field audit found that the best available estimate indicates that the database is not accurate within $\pm 5.0\%$. 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 p.a. kWh lower than the database indicates.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: Low Actual impact: Low Audit history: Three times Controls: Moderate Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
<p>Medium</p>	<p>Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time, but there is room for improvement.</p> <p>The impact is assessed to be medium based on the kWh volumes.</p>		
Actions taken to resolve the issue	Completion date	Remedial action status	
<p>Genesis has reviewed the auditors finding and have highlighted these to STDC with the intent that STDC makes every effort to ensure that dataset is sent monthly, accurately maintained and gear wattage is provided.</p>	<p>Continuous Improvement</p>	<p>Identified</p>	
Preventative actions taken to ensure no further issues will occur	Completion date		
<p>Genesis will send monthly reminders to STDC requesting the dataset and will report exceptions identified</p>	<p>Continuous Improvement</p>		

CONCLUSION

Based on the field audit of 191 items of load, the best available estimate indicates that the database is not accurate within $\pm 5\%$. 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 p.a. kWh lower than the database indicates. There are a fairly small number of light differences, but several related to higher wattage sodium lights which had not been removed from the database when upgrades occurred.

A small number of other discrepancies were identified during review of the database information and are assessed to have a low impact on submission.

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, and the same kW value is applied for each day of the month when calculating submissions. 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. I compared these values to the database extract received on 13 April 2023 and found that use of the January kW values could have resulted in under submission of up to 254.49 kWh for March 2023. Revised data is expected to be provided through the wash up process once correct values are confirmed.

Seven non-compliances were identified, and no recommendations are made. The future risk rating of 18 indicates that the next audit be completed in six months. I have considered this in conjunction with Genesis' comments and recommend that the next audit be in ten months.

Participant response

Genesis continues to work with the council to increase accuracy levels in their database, will send monthly reminders to STDC requesting the dataset and will also report exceptions identified.