ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA HAWKES BAY AND MERIDIAN ENERGY

Prepared by: Steve Woods

Date audit commenced: 1 February 2021

Date audit report completed: 16 March 2021

Audit report due date: 1 March 2021

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EXECUTIVE SUMMARY

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

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

The relevant ICPs are shown below. The data for ICP 0000939905HB23E was previously held in a RAMM database managed by Power Solutions. The data for ICP 7012031000CH80C was previously held in a RAMM database held by Beca. Both ICPs are now in a RAMM database manged by Stantec on behalf of NZTA. New connection, fault and maintenance work is completed by Pope Electrical. Monthly reports are received by Meridian.

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000939905HB23E	NZTA STREET LIGHTS	RDF0331	DST	669	125,974
7012031000CH80C	Streetlighting Transit NZ	WPW0331	DST	138	23,640

The field audit found the database accuracy was 99.6%, indicating that compliance is achieved because the error and confidence interval are both within 5%.

A small number of errors were identified by the database analysis. Stantec has already corrected the database.

This audit found five non-compliances and no recommendations were made. The future risk rating of 10 indicates that the next audit be completed in 12 months' time. I have considered this in conjunction with Meridian's response and the size of the database and recommend that the next audit be in 18 months, reflecting that the database accuracy was high and that several of the issues identified have been resolved.

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 current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Two blank descriptions and wattages.	Moderate	Low	2	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three additional items of load identified by the field audit.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	122 items of load have the incorrect ballast applied. One item of load with the incorrect ICP recorded. Two items of load with blank description and wattage. Delays in updating the database for new connections. Burness Road underpass lights are recorded in the database as 3x 36W fluorescent light. These lights have been replaced with an LED panel that is on 24 hours a day.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions.	Moderate	Low	2	Identified
Future Risk Rating						10	

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	Description	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

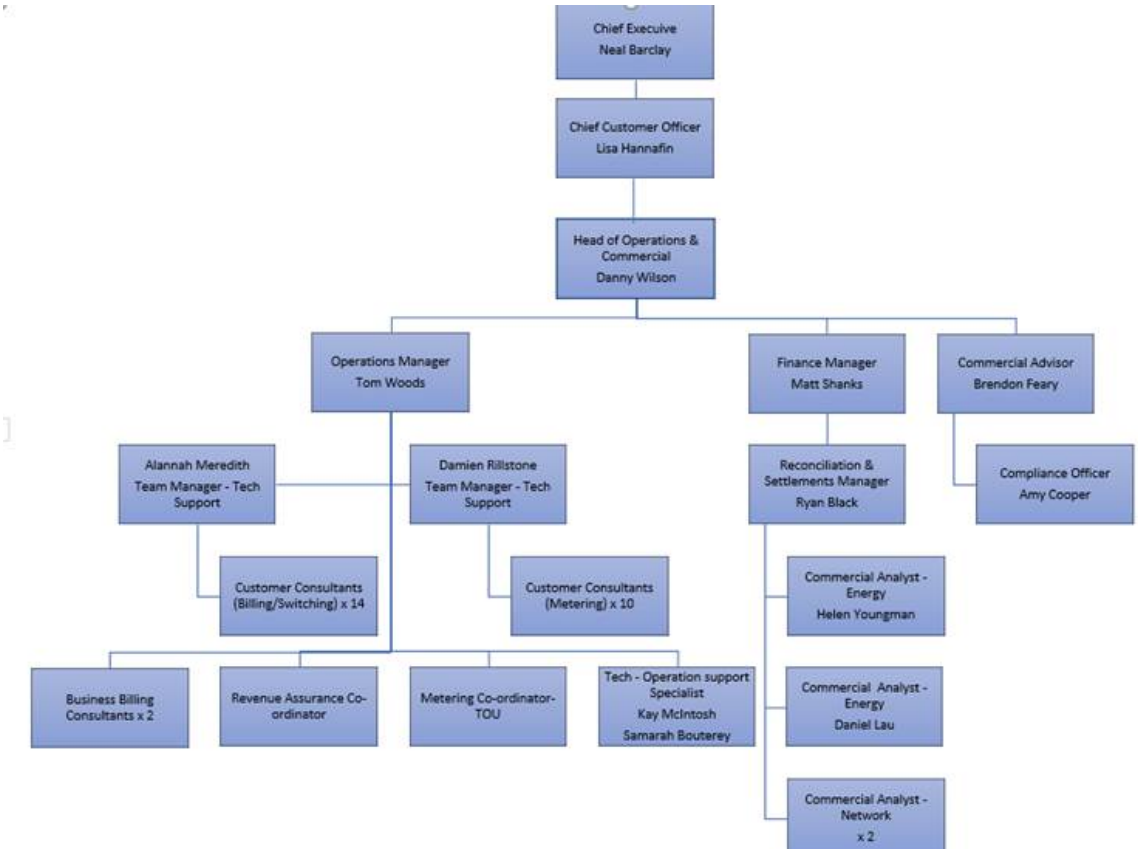
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Kara Atkinson		NZ Streetlighting
Martin Hunter	Technical Specialist RAMM	`Stantec

1.4. Hardware and Software

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

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

Systems used by the trader and their agent 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

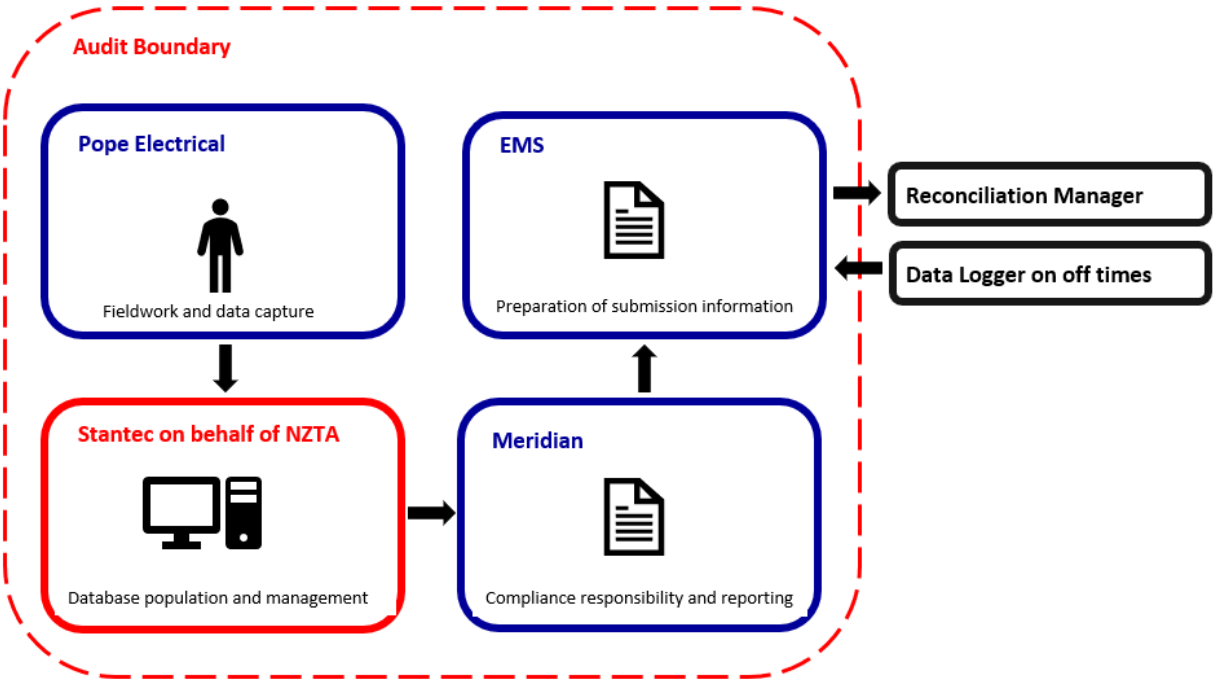
ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000939905HB23E	NZTA STREET LIGHTS	RDF0331	DST	669	125,974
7012031000CH80C	Streetlighting Transit NZ	WPW0331	DST	138	23,640

1.7. Authorisation Received

All information was provided directly by Meridian, NZ Streetlighting and Stantec.

1.8. Scope of Audit

The database is remotely hosted by RAMM Software Ltd and is managed by Stantec on behalf of NZTA, who is Meridian's customer. Reporting is provided by Stantec to Meridian on a monthly basis. The fieldwork and asset data capture are conducted by Pope Electrical. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



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

The field audit was undertaken of a statistical sample of 264 items of load in February 2021.

1.9. Summary of previous audit

The previous audits were completed in May 2020 by Rebecca Elliot of Veritek Limited for ICP 0000939905HB23E and March 2019 for ICP 7012031000CH80C. The tables below show the findings.

Table of Non-Compliance – ICP 0000939905HB23E

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	25 items of load with the incorrect ICP recorded against them. Submission information appears correct, but it doesn't match the database volume.	Cleared
			The database accuracy is assessed to be 94.8% of the database for the sample checked indicating a potential over submission of approximately 22,200 kWh per annum.	Cleared
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Items of load recorded against incorrect ICPs in the database.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 94.8% of the database for the sample checked indicating a potential over submission of approximately 22,200 kWh per annum.	Cleared
			3 items of load have with the incorrect ballast applied.	Still existing
			25 items of load with the incorrect ICP recorded against them - submission is correct.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	25 items of load with the incorrect ICP recorded against them. Submission information appears correct, but it doesn't match the database volume.	Cleared
			The database accuracy is assessed to be 94.8% of the database for the sample checked indicating a potential over submission of approximately 22,200 kWh per annum.	Cleared
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing

Table of Non-Compliance – ICP 7012031000CH80C

Subject	Section	Clause	Non-compliance	Status
Distributed unmetered load audits	1.10	16A.26 and 17.295F	The DUML audit was not submitted to the EA by its due date, 01/03/2019.	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	Four items of load have missing lamp or ballast wattages, and 84 items of load have incorrect lamp or ballast wattages. This will result in potential under recording of 381W or 1,627 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Differences between the wattage used for submission, wattage recorded in the database could result in 4,189 kWh per annum of over submission.	Cleared Cleared
ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)	2.2	11(2)(a) and (aa) of Schedule 15.3	The ICP is not recorded in the database.	Cleared
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Three items of load have missing lamp wattages, and one item of load has a missing gear wattage.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Four items of load have missing lamp or ballast wattages, and 84 items of load have incorrect lamp or ballast wattages. This will result in potential under recording of 381W or 1,627 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). None of the items of load have an ICP number recorded.	Still existing Cleared

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	11(1) of Schedule 15.3	Four items of load have missing lamp or ballast wattages, and 84 items of load have incorrect lamp or ballast wattages. This will result in potential under recording of 381W or 1,627 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Differences between the wattage used for submission, wattage recorded in the database could result in 4,189 kWh per annum of over submission.	Cleared Cleared

Subject	Section	Description	Recommendation	Status
Tracking of load changes	2.6	Comparison between Central Hawke's Bay DC and NZTA Waipukurau RAMM records.	Compare the lights recorded against Central Hawke's Bay DC and NZTA Waipukurau in RAMM to ensure that all load is accounted for and recorded against the correct entity and ICP.	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

Meridian have requested Veritek to undertake this streetlight audit.

Audit commentary

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

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, and*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined.

Audit commentary

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

I compared the database output file to the capacity information Meridian supplied to EMS for November 2020 and found the totals matched. The previous audit for ICP 0000939905HB23E found the monthly reporting was incorrect and that some non-NZTA lighting was included in the database. This matter is now resolved.

The field audit found the database accuracy was 99.6%, indicating that compliance is achieved because the error and confidence interval are both within 5%.

As recorded in the previous audit for ICP 0000939905HB23E, the Burness Road underpass lights are recorded in the database as 3x 36W fluorescent light. These lights have been replaced with an LED panel that is on 24 hours a day (see picture below for reference). It is thought that these are connected to the metered pump supply which is housed at one end of the tunnel. This was being investigated at the time of the previous audit. If these are unmetered LEDs, then a new ICP needs to be created to correctly reconcile this load. The 3 x 36W fluorescent lights should be removed from the database. This is recorded as non-compliance in **section 3.**1 as part of the database accuracy clause.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-May-20 To: 08-Feb-21	The current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions. 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	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Where significant historical corrections are made in the database, our process will take these into account for revision of submissions.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
A full database extract is now received each month and any significant change to wattage is reviewed so historic changes are identified and accounted for in wash ups.	Ongoing	

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, and*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm an ICP is recorded for each item of load.

Audit commentary

An ICP is recorded for each item of load. One item of load appears to have the incorrect ICP recorded. This is discussed further in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

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

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

Audit commentary

Lamp make, lamp model, lamp wattage and ballast wattage fields are included in the database. Light IDs 64579 and 64580 are both blank for description and wattage.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-May-20 To: 08-Feb-21	Two blank descriptions and wattages. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Blank descriptions and wattages have been updated	Feb 2021	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
A full database extract is now received each month and is reviewed for any missing information.	Ongoing	

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 264 items of load.

Audit commentary

The field audit discrepancies are detailed in the table below.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
BURNESS UNDERPASS	3	multiple	-3		3x 36W fluorescents have been replaced with an LED wall panel that runs 24 hours a day and is thought to be connected to the pump metered supply.
Road ID 3808	14	14	0	5	1x150watt HPS recorded as 100watt HPS. 1x136watt LED recorded as 250watt HPS, 3x136watt LED recorded as 146watt LED.
Road ID 3823	23	23	+1-1	0	Additional 102watt LED found. 1x 100watt HPS not found.
Road ID 1817	47	49	2	3	1x LED recorded as 150 watt HPS. 2x LED recorded as 250 watt HPS. Additional 150 watt HPS found outside number 43. Additional MH 250 found outside number 99.
Road ID 1818	75	75	0	1	1x LED recorded as 250 watt HPS.

The field audit found some errors. The database accuracy is detailed in **section 3.1**.

Three examples were found of additional lights in the field therefore non-compliance is recorded.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-May-20 To: 08-Feb-21	Three additional items of load identified by the field audit. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Location of the additional lights identified is being verified so these lights can be added to the database.	March 2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Management of the database has recently moved to Stantec and it is expected this will result in improved controls and better accuracy of the database ongoing.	Ongoing	

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.

The change management process and the compliance of the database reporting provided to Meridian is detailed in **sections 3.1** and **3.2**.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

Audit observation

The database was checked for audit trails.

Audit commentary

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

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

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

Plan Item	Comments
Area of interest	NZTA Napier and Central Hawkes Bay
Strata	The database contains items of load in the Napier urban area and Central Hawkes Bay. The processes for the management of all NZTA items of load are the same, and I decided to place the items of load into four strata, as follows: 1. NZTA HB1, 2. NZTA HB2, 3. NZTA HB3, and 4. NZTA HB4.
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 18 sub-units.
Total items of load	264 items of load or 33% of the total database were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

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

Audit commentary

A field audit was conducted of a statistical sample of 264 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	99.6	Wattage from survey is lower than the database wattage by 0.4%
R_L	98.8	With a 95% level of confidence, it can be concluded that the error could be between -1.2% and +0.1%
R_H	100.1	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19 and the table below shows that Scenario A (detailed below) applies.

The conclusion from Scenario A is that the database is accurate to within +/- 5%.

In absolute terms the installed capacity is estimated to be 1.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 2.0 kW lower to the same as the database.

In absolute terms, total annual consumption is estimated to be 2,400 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 7,500kWh p.a. lower to 400 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 %.

Lamp description and capacity accuracy

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 following errors were found.

Make	Ballast applied	Correct ballast	No. of lights	Wattage difference
250W HP Sodium	18	28	1	-10
150W HP Sodium	28	18	2	+20
150W HP Sodium	12	18	1	-6
100W HP Sodium	12	14	116	-232
135 LP Sodium	0	36	2	-72
			Total	-300
			Total annual kWh	-1,281

These have been passed to Stantec who are already in the process of updating the database.

As recorded in **section 2.4**, light IDs 64579 and 64580 are both blank for description and wattage.

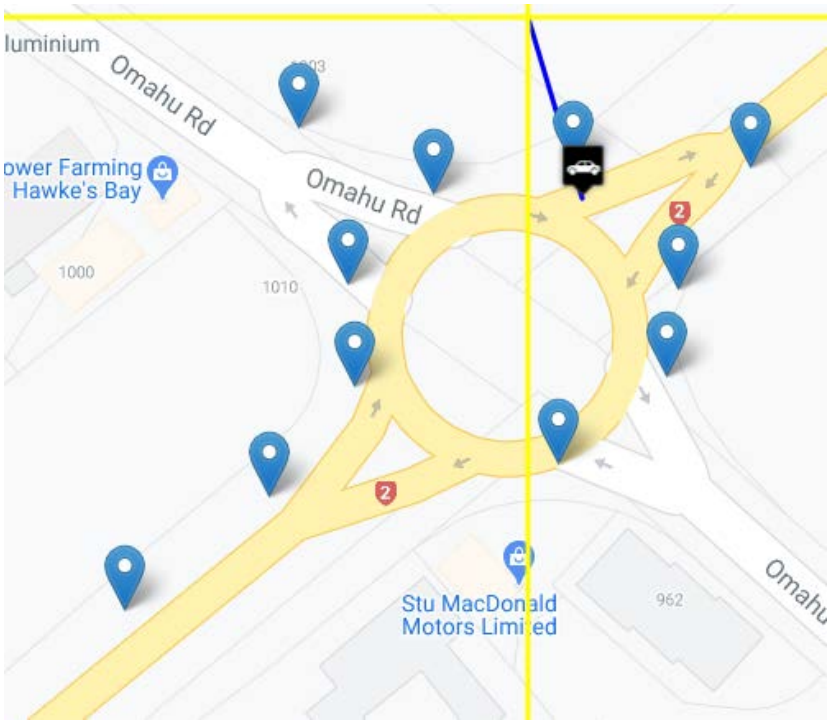
As recorded in the previous audit for ICP 0000939905HB23E, the Burness Road underpass lights are recorded in the database as 3x 36W fluorescent light. These lights have been replaced with an LED panel that is on 24 hours a day (see picture below for reference). It is thought that these are connected to the metered pump supply which is housed at one end of the tunnel. This was being investigated at the time of the previous audit. If these are unmetered LEDs, then a new ICP needs to be created to correctly reconcile this load. The 3 x 36W fluorescent lights should be removed from the database. This is recorded as non-compliance in **section 3.**1 as part of the database accuracy clause.

Location accuracy

The field audit did not identify any location discrepancies.

ICP number and owner accuracy

Light ID 58378 on Road ID 3863 appears to have the incorrect ICP. It is at the Omahu Roundabout, but all other items of load at this roundabout are against ICP 0000048331HBAC2. The maps below show this item of load and the bottom map shows the other items of load.



Change management process findings.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. All fault and maintenance work is controlled by Stantec and conducted by Pope Electrical. Once each job is completed the notification is provided in a template for Stantec to update RAMM.

For new installations, the database is updated once "as builts" are provided, however this can take a long time, sometimes many months or more than a year.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-May-20 To: 08-Feb-21	122 items of load have the incorrect ballast applied. One item of load with the incorrect ICP recorded. Two items of load with blank description and wattage. Delays in updating the database for new connections. Burness Road underpass lights are recorded in the database as 3x 36W fluorescent light. These lights have been replaced with an LED panel that is on 24 hours a day. Potential impact: Medium 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 because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
All issues identified have been corrected in the database. The Burness Road lights were identified as metered on another ICP and this is now reflected in the database.	Feb 2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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, and*
- *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

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

I compared the database output file to the capacity information Meridian supplied to EMS for November 2020 and found the totals matched. The previous audit for ICP 0000939905HB23E found the monthly reporting was incorrect and that some non-NZTA lighting was included in the database. This matter is now resolved.

The field audit found the database accuracy was 99.6%, indicating that compliance is achieved because the error and confidence interval are both within 5%.

As recorded in the previous audit for ICP 0000939905HB23E, the Burness Road underpass lights are recorded in the database as 3x 36W fluorescent light. These lights have been replaced with an LED panel that is on 24 hours a day (see picture below for reference). It is thought that these are connected to the metered pump supply which is housed at one end of the tunnel. This was being investigated at the time of the previous audit. If these are unmetered LEDs, then a new ICP needs to be created to correctly reconcile this load. The 3 x 36W fluorescent lights should be removed from the database. This is recorded as non-compliance in **section 3.**1 as part of the database accuracy clause.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(b) From: 01-May-20 To: 08-Feb-21	The current monthly report is provided as a snapshot and is non-compliant. The report contains a lamp install date, but this is not used to re-calculate historic submissions. 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	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Where significant historical corrections are made in the database, our process will take these into account for revision of submissions.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
A full database extract is now received each month and any significant change to wattage is reviewed so historic changes are identified and accounted for in wash ups.	Ongoing	

CONCLUSION

The relevant ICPs are shown below. The data for ICP 0000939905HB23E was previously held in a RAMM database managed by Power Solutions. The data for ICP 7012031000CH80C was previously held in a RAMM database held by Beca. Both ICPs are now in a RAMM database manged by Stantec on behalf of NZTA. New connection, fault and maintenance work is completed by Pope Electrical. Monthly reports are received by Meridian.

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000939905HB23E	NZTA STREET LIGHTS	RDF0331	DST	669	125,974
7012031000CH80C	Streetlighting Transit NZ	WPW0331	DST	138	23,640

The field audit found the database accuracy was 99.6%, indicating that compliance is achieved because the error and confidence interval are both within 5%.

A small number of errors were identified by the database analysis. Stantec has already corrected the database.

This audit found five non-compliances and no recommendations were made. The future risk rating of 10 indicates that the next audit be completed in 12 months' time. I have considered this in conjunction with Meridian's response and the size of the database and recommend that the next audit be in 18 months, reflecting that the database accuracy was high and that several of the issues identified have been resolved.

PARTICIPANT RESPONSE