ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

INVERCARGILL CITY COUNCIL AND TRUSTPOWER LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 2 September 2019

Date audit report completed: 30 October 2019

Audit report due date: 30-Oct-19

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EXECUTIVE SUMMARY

This audit of the Invercargill City Council (**ICC**) Unmetered Streetlights DUML database and processes was conducted at the request of Trustpower Limited (**Trustpower**) 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.

Trustpower use data from the ICC RAMM database to reconcile this load. ICC provide a monthly report to Trustpower of this database.

The field audit was undertaken of a statistical sample of 396 items of load on 1st October 2019.

The LED replacement project has largely been completed with approximately 1,000 lights still to go. These are mostly pedestrian crossing and walkway lights. This audit has found a similar level of error to that found in the last indicating that the accuracy of data capture for the LED roll out hasn't been to the expected standard (detailed in **section 2.5**) and I recommend a 100% field audit to address this.

The audit found five non-compliances and makes two recommendations. The future risk rating of 31 indicates that the next audit be completed in three months. I have considered this in conjunction with Trustpower's responses and agree with this recommendation as this should confirm the responses provided and the following audit date should be able to be longer as the database accuracy will have improved.

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	Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.**1. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Weak	High	9	Identified
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Two items of load with insufficient details to locate them.	Strong	Low	1	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Six additional lights were found in the field.	Weak	Low	3	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled.	Weak	High	9	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.**1. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Weak	High	9	Identified
Future Risk Rating						31	

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	Action
Database Accuracy	3.1	LED light specifications to be provided for next audit to confirm the correct wattage is recorded in the database.	ICC staff have gathered together all the specification for lights that are currently in use on their lighting network
		100% field audit is undertaken to ensure database accuracy thresholds are met.	This has been carried out

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

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

Audit commentary

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

1.2. Structure of Organisation

Trustpower provided a copy of their organisational structure:

1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Russell Pearson	Roading Manager	Invercargill City Council
David McCormick	Engineering Services	Invercargill City Council
Robbie Diederen	Reconciliation Analyst	Trustpower
Barry Harkerss	Commercial Account Manager	Trustpower

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".

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

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

ICP Number	Description	NSP	Number of items of load	Database wattage (watts)
0008801003TPFE8	ICC LIGHTS – TPC URBAN	INV0331	1,197	101,936
0008801013TP545	ICC LIGHTS - TPC RURAL	INV0331	182	31,660
0008803002NV4BD	ICC LIGHTS - EIL INVERCARGILL	INV0331	5083	392,177
0008803012NVE10	ICC LIGHTS - EIL INVERCARGILL	INV0331	375	39,560
Total			**6,837**	**565,333**

I note that the database has 1,171 items of load where the ICP is recorded as "PRIVATE". Powernet have confirmed that these are as recorded as standard or shared unmetered load against the relevant ICP and are therefore excluded from submission and the scope of this audit.

1.7. Authorisation Received

All information was provided directly by Trustpower and ICC.

1.8. Scope of Audit

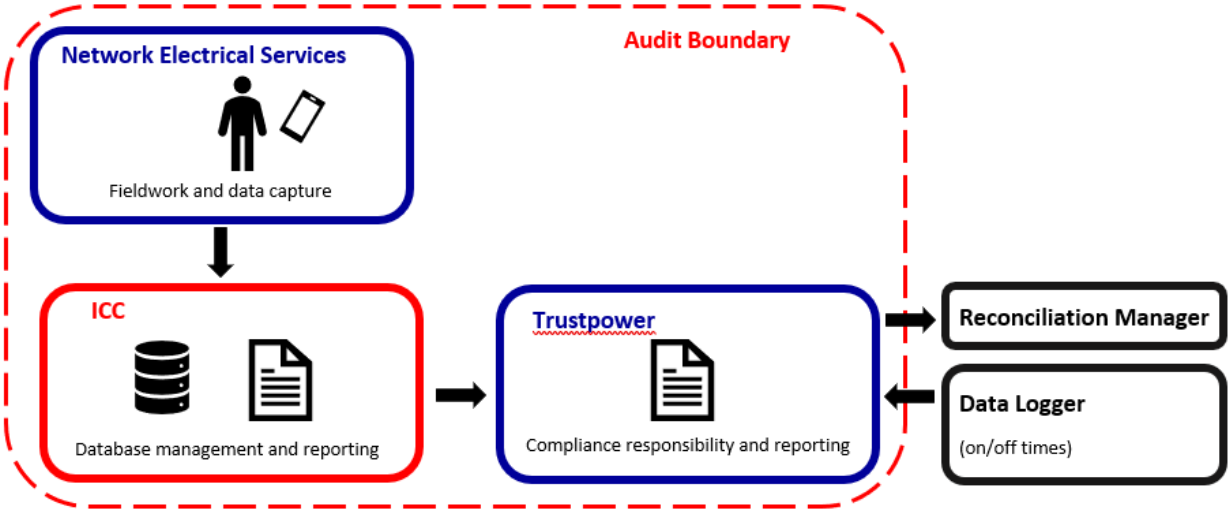
This audit of the ICC DUML database and processes was conducted at the request of Trustpower, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

Trustpower use ICC's RAMM database for submission. ICC provide a monthly report to Trustpower of this database.

ICC's contractor for streetlight installation and maintenance is Network Electrical Servicing.

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 carried out at ICC's premises and a field audit of 396 items of load was undertaken in Invercargill on the 1st October 2019.

1.9. Summary of previous audit

The previous audit was undertaken by Rebecca Elliot of Veritek Limited in April 2019. Five non-compliances were identified, and no recommendations were made. The statuses of the non-compliances and recommendation are described below.

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Distributed unmetered load audits	1.10	16A.26	Audit not completed by the due date.	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	The database accuracy is assessed to be 77.4% indicating a potential over submission of approximately 699,900 kWh per annum. 16 items of load with either an incorrect lamp description or wattage or ballast applied.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three additional lights were found in the field.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 77.4% indicating a potential over submission of approximately 699,900 kWh per annum. 16 items of load with either an incorrect lamp description or wattage or ballast applied.	Still existing

Subject	Section	Clause	Non-Compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 77.4% indicating a potential over submission of approximately 699,900 kWh per annum. 16 items of load with either an incorrect lamp description or wattage or ballast applied.	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 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

Trustpower 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. TBD

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

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information.

I recalculated the submissions for August 2019 for using the data logger and database information. I confirmed that the calculation method was correct.

The database used to calculate submission does not meet the accuracy threshold required by the code. This is detailed in in **section 3.1** and recorded as non-compliance below.

On 18 June 2019, the Electricity Authority issued a memo confirming that 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 this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. 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.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-19 To: 30-Sep-19	Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.**1. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak as the level of error found in the field indicates that quality controls in place do not ensure an acceptable level of accuracy. The impact is assessed to be high based on the database accuracy detailed in **section 3.1.** .

Actions taken to resolve the issue	Completion date	Remedial action status
ICC staff have carried out a complete field audit and a desk top cleansing to correct these issues. Tests have been arranged to check the loading of the festive lights and a procedure has been drawn up so these can be added to the DB when required. The ICC DB does incorporate the day in which an item is added or altered but how this is reported to TP on a monthly basis so TP can accurately bill the changes	25/10/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The contractor and Asset Manager have both introduced monthly procedures as new controls to ensure that these issues will not re-occur in the future. We will monitor progress to ensure that preventative actions is effective.	30/10/2019	

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

Code reference

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

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm the correct ICP was recorded against each item of load.

Audit commentary

There are 1,171 items of load recorded as 'PRIVATE'. These have been confirmed as private lights with Powernet and are recorded as either shared or standard unmetered load against the relevant ICP. These are therefore excluded from this audit.

All other items of load have an ICP recorded against them.

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 road name, house address, location (displacement), pole number and GPS coordinates to assist with location.

All but two items of load have sufficient details to locate them. Light ID's 36836 and 21458 have the road name recorded but no GPS co-ordinates, metres from the end of the road or road number. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 01-Apr-19 To: 30-Sep-19	Two items of load with insufficient details to locate them. Potential impact: None Actual impact: None Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong as location details are captured using GPS co-ordinates to ensure items of are locatable, but this has been missed in two instances. The impact is assessed to be none as only two lights were affected but this is recorded as low as none is not an available option.

Actions taken to resolve the issue	Completion date	Remedial action status
The contractor has been instructed to update the complete DB with the correct locations for all items	8/11/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The Asset Manager and contractor have been given a new procedure to monitor and record each new dispatch request. We will monitor progress to ensure that preventative action is effective.	30/10/2019	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The extract provided has fields for lamp make and lamp model as well as lamp wattage, gear wattage and total wattage and all were populated.

The accuracy of the lamp description, capacity and ballasts recorded is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of 396 lights using the statistical sampling methodology. The population was divided into the following strata:

- Urban Local Authority A-G
- Urban Local Authority H-P
- Urban Local Authority Q-Z
- NZTA A-M
- NZTA N-Z.

Audit commentary

The field audit findings for the sample of lamps was accurate with the exception of the streets detailed in the table below:

Location	Database Count	Field Count	Count differences	Wattage differences	Comments
ARGYLE ST	3	4	+1	-	1x extra 33W LED found in the field.
BRADSHAW ST	3	3	+1 -1		1x extra 70W HPS found in the field. 1x double fluorescent 60W missing in the field.
CATHERINE ST	19	18	-1		1x 80W MV missing in the field.
CRICKET ENTRANCE	3	3		3	3x 83W LEDs found in the field not 3 HPS lights of various wattages.
EAST ROAD (SH1)	23	23		1	1x 97W LED found in the field not 70W HPS
ELLES RD WEST	14	18	+4	1	4x extra 77W LED found in the field. 1x 86W LED found in the field not 140W BETA COSM.
FORTH ST	27	25	-2	1	2x 250W HPS not found in the field. 1x 21.4W LED recorded as 77W LED.
HOLLOWAY ST	8	8		1	1x 70W HPS found in the field not 60W FLURO.
HOLYWOOD TCE	6	5	-1		1x 21.4W LED missing in the field.

Location	Database Count	Field Count	Count differences	Wattage differences	Comments
ISLINGTON ST	21	19	-2	2	2x 21.4 W LED missing in the field. 2x 70W HPS recorded as 21.4W LED.
KIOSK ROAD CARPARK	6	6		2	2x 27W LED recorded as 70W HPS.
METZGER ST (5503)	23	23		4	2x pedestrian crossing lights recorded as LED but HPS or similar found in the field. 2x HPS lights recorded in the database but LED found in the field.
MYERS ST	2	1	-1		1x 70W HPS missing in the field.
NEWCASTLE ST	19	18	-1		1x 21.4W LED missing in the field.
NORTHWOOD AVE EAST	3	3		3	3x 21.4W LED recorded as 70W HPS.
ONSLOW ST(BLF)	7	7		1	1x 70W HPS recorded as 40W FLURO in database.
RETREAT RD	2	2		2	2x LEDs recorded as HPS lights in the database.
STIRLING ST	5	4	-1		1x 21.4W LED missing in the field.
TRAMWAY RD	41	39	-2	3	2x HPS lights missing in the field. 1x 70W HPS recorded as DBL FLURO. 2x 97W LED recorded as 135W LED in the database.
GRAND TOTAL	**396**	**402**	**18**	**24**	

The field audit found six additional lights in the field. This is recorded as non-compliance below.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Apr-19 To: 30-Sep-19	Six additional lights were found in the field. Potential impact: Medium Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as weak, as the level of error found in the field indicates that quality control in relation to what is entered into the database and what is in the field is not identifying discrepancies. The impact is assessed to be low based on small number of additional lights found in the field compared to the overall sample checked.

Actions taken to resolve the issue	Completion date	Remedial action status
ICC has completed a field audit to address all these issues	25/10/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The Asset Manager and contractor has been given a new procedure to monitor and record each new dispatch request. We will monitor progress to ensure that preventative action is effective.	30/10/2019	

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 Trustpower 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

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

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

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

Plan Item	Comments
Area of interest	Invercargill City Council region
Strata	The database contains items of load in Invercargill City Council area. The processes for the management of ICC items of load are the same, but I decided to place the items of load into five strata, as follows: 1. Urban Local Authority A-G 2. Urban Local Authority H-P 3. Urban Local Authority Q-Z 4. NZTA A-M 5. NZTA N-Z
Area units	I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 54 sub-units or 5% of the total database wattage.
Total items of load	396 items of load were checked.

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

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

Audit commentary

A statistical sample of 396 items of load found that the field data was 96.7% of the database data for the sample checked.

Result	Percentage	Comments
The point estimate of R	94.8%	Wattage from survey is lower than the database wattage by 5.2%
R_L	89.5%	With a 95% level of confidence it can be concluded that the error could be between -10.5% and -0.8%
R_H	99.2%	

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 C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 10.5% to 0.8% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 29.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 59 kW and 5 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 124,700 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 253,700 kWh p.a. and 19,200 kWh p.a. lower 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 table produced by the Electricity Authority. Only 17 discrepancies were found as detailed in the table below:

Incorrect lamp wattages and ballasts	Estimated volume information impact (annual kWh)
Light ID 29930 has both an LED and HPS light description and a HPS lamp value recorded with no ballast applied. ICC are investigating what is in the field and will correct this.	Unable to determine
12 x Phillips 140W COSMOS with no ballast applied.	666 kWh under submission
1 x 100W HPS with no ballast applied.	60 kWh under submission
2 x 250W HPS with a 25W ballast applied. The correct ballast is 28W.	26 kWh under submission
4 x 70W HPS with no ballast applied.	222 kWh under submission
TOTAL	974 kWh under submission

This is also recorded as non-compliance in **sections 2.1** and **3.2**.

The LED light specifications have been requested to confirm that the correct wattage value has been recorded in the database. This was not provided in time for this to be reviewed as part of this audit and therefore I cannot confirm compliance. I recommend that this information be provided for the next audit.

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	LED light specifications to be provided for next audit to confirm the correct wattage is recorded in the database.	ICC staff have gathered together all the specification for lights that are currently in use on their lighting network	Identified

Change management process findings

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. Fault, maintenance and LED upgrade work is completed by Network Electrical Services.

New subdivisions require a proposed plan to be provided and an "as built" plan once the development is complete. New streetlights are only electrically connected once they have been vested. When the lights are vested to the council they are added to the database.

Outage patrols are conducted by ICC for the NZTA lights covering the whole network about every six weeks and fortnightly for pedestrian crossings. There are no outage patrols for the LED lights as the failure rate is so low.

The LED replacement project has largely been completed with approximately 1,000 lights still to go. These are largely pedestrian crossing and walkway lights. This audit has found a similar level of error to that found in the last indicating that the accuracy of data capture for the LED roll out hasn't been to the expected standard (detailed in **section 2.5**). I recommend a 100% field audit to correct this.

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Recommend that 100% field audit is undertaken to ensure database accuracy thresholds are met.	This has been carried out	Identified

Changes are endeavoured to be made to the database by the 25th of the month so they can be included in the monthly report.

The dimming trial on the metered circuit has finished and there are no immediate plans to introduce dimming on the rest of the network.

Festive lighting was discussed, and this is connected into an unmetered circuit and advised to Trustpower by email. This does not meet the requirements of the code and these items of load should be added to the database and with electrically connected and disconnected dates recorded so these can be included for the correct consumption period.

Private lights are recorded in the database for the council's reference and are the responsibility of PowerNet and are therefore not within the scope of this audit.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-19 To: 30-Sep-19	Database is not confirmed as accurate with a 95% level of confidence. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled. Potential impact: High Actual impact: High Audit history: Twice Controls: Weak Breach risk rating:9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak as the level of error found in the field indicates that quality controls in place do not ensure an acceptable level of accuracy. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
ICC have confirmed that their database has been updated to reflect the recent field audit	30 Oct 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The contractor and Asset Manager have both introduced procedures on a monthly basis so these issues will not re-occur in the future. We will monitor progress to ensure that preventative actions is effective.	Ongoing	

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

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

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

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information.

I recalculated the submissions for August 2019 for using the data logger and database information. I confirmed that the calculation method was correct.

There is some inaccurate data within the ICC's database used to calculate submissions. This is recorded as non-compliance and detailed in **sections 2.1**, **2.5** and **3.1**.

On 18 June 2019, the Electricity Authority issued a memo confirming that 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 this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. 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.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Apr-19 To: 30-Sep-19	Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.**1. 19 items of load with either an incorrect lamp description or wattage or ballast applied resulting in an estimated 974kWh under submission. Festive lights connected to unmetered circuits not tracked in the database resulting in an estimated minor volume of load not being reconciled. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak, as the level of error found in the field indicates that quality controls in place do not ensure an acceptable level of accuracy. The impact is assessed to be high based on the database accuracy detailed in **section 3.1.** .

Actions taken to resolve the issue	Completion date	Remedial action status
ICC staff have carried out a complete field audit and a desk top cleansing to correct these issues. Tests have been arranged to check the loading of the festive lights and a procedure has been drawn up so these can be added to the DB when required. The ICC DB does incorporate the day in which an item is added or altered but how this is reported to TP on a monthly basis so TP can accurately bill the changes	25/10/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The contractor and Asset Manager have both introduced procedures on a monthly basis so these issues will not re-occur in the future. We will monitor progress to ensure that preventative actions is effective.	30/10/2019	

CONCLUSION

Trustpower use data from the ICC RAMM database to reconcile this load. ICC provide a monthly report to Trustpower of this database.

The field audit was undertaken of a statistical sample of 396 items of load on 1st October 2019.

The LED replacement project has largely been completed with approximately 1,000 lights still to go. These are mostly pedestrian crossing and walkway lights. This audit has found a similar level of error to that found in the last indicating that the accuracy of data capture for the LED roll out hasn't been to the expected standard (detailed in **section 2.5**) and I recommend a 100% field audit to address this.

The audit found five non-compliances and makes two recommendations. The future risk rating of 31 indicates that the next audit be completed in three months. I have considered this in conjunction with Trustpower's responses and agree with this recommendation as this should confirm the responses provided and the following audit date should be able to be longer as the database accuracy will have improved.

PARTICIPANT RESPONSE

Trustpower have reviewed this report and their comments are recorded in the body of the report. No further comments were provided.