

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

KAWERAU DISTRICT COUNCIL
AND GENESIS ENERGY LIMITED

Prepared by: Steve Woods

Date audit commenced: 18 September 2019

Date audit report completed: 1 November 2019

Audit report due date: 01-Oct-19

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EXECUTIVE SUMMARY

This audit of the Kawerau District Council (**KDC**) 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 scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. A RAMM database is managed by Opus on behalf KDC in relation to this load. The field work is carried out by Broadspectrum. Pocket RAMM is used in the field to update the RAMM database directly.

Genesis use the daily kWh figure recorded in the registry to reconcile this load. Genesis have been provided with a wattage report but found the data quality to be too poor to use for submission purposes. Genesis intend to move to the KDC data once the database accuracy is confirmed. KDC have undertaken a 100% field audit to update the RAMM database but this data hadn't been uploaded to RAMM at the time of this audit. KDC will send a monthly wattage reports once this has been completed.

Analysis of the database found:

- Missing wattage values
- Lamp wattages recorded as ballast values
- A large volume of additional lights found in the field audit.
- A large proportion of incorrect wattages in the database

The combination of these factors means that it is not possible to calculate accurately the difference between the registry figure used for submission, and what is installed in the field.

This audit found seven non-compliances and makes one recommendation. The future risk rating of 44 indicates that the next audit be completed in three months, but I recommend that the next audit be in six months to allow time for remedial actions.

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 | Historic registry figure used for submission RAMM database is not accurate. | Weak | High | 9 | Identified |
| ICP Identifier | 2.2 | 11(2)(a) & (aa) of Schedule 15.3 | ICP is not recorded in the database. | Weak | Low | 3 | Identified |
| Location of each item of load | 2.3 | 11(2)(b) of Schedule 15.3 | 27 items of load with insufficient location details. | Moderate | Low | 2 | Identified |
| Description and capacity of each item of load | 2.4 | 11(2)(c)&(d) of Schedule 15.3 | 29 items of load with no lamp descriptions, lamp wattage and ballast detailed 183 items of load with no lamp wattage or ballast wattage recorded | Weak | Medium | 6 | Identified |
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3 | 41 lights not included in the database extract. | Weak | Medium | 6 | 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) | In absolute terms the installed capacity is estimated to be 13.0 kW higher than the database indicates. Lamp wattage is recorded as ballast wattage. 29 items of load with no lamp descriptions, lamp wattage and ballast detailed 183 items of load with no lamp wattage or ballast wattage recorded 27 items of load did not have a street number or GPS coordinates Festive lighting is connected but the volume is not recorded | Weak | High | 9 | Identified |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | Historic registry figure used for submission. RAMM database is not accurate | Weak | High | 9 | Identified |
| Future Risk Rating | | | | | | 44 | |

| | | | | | | |
|-----------------------------------|-----------|-----------|-----------|-----------|----------|----------|
| 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 |
|-------------------------|---------|--------------------------------|---|
| Tracking of load change | 2.6 | Record festive lights in RAMM. | Genesis will request this information to be supplied. |

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

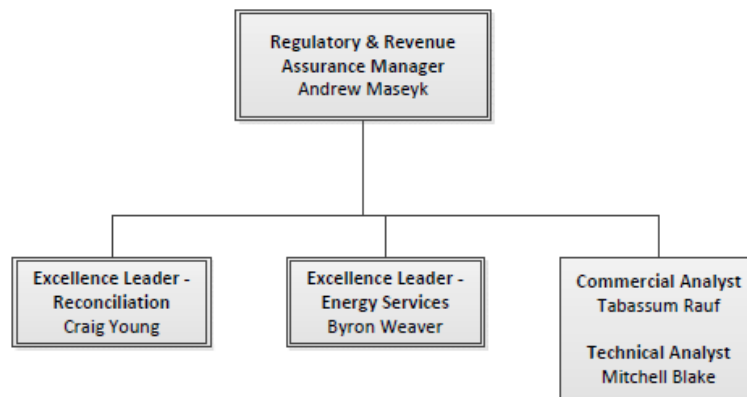
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

| Name | Title | Company |
|---------------|--|----------------|
| Craig Young | Excellence Leader - Reconciliation | Genesis Energy |
| Grace Hawken | Technical Specialist - Reconciliation Team | Genesis Energy |
| Andre Erasmus | Engineering Manager | Kawerau DC |

1.4. Hardware and Software

The registry figures are used to calculate submission. KDC have a SQL database used for the management of DUML called RAMM. This is remotely hosted by RAMM Software Ltd. "RAMM" stands for "Roading Asset and Maintenance Management".

KDC 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 | Profile | Number of items of load | Database wattage (watts) |
|-----------------|------------------------|---------|-------------------------|--------------------------|
| 1000023043BP177 | Street Lights, KAWERAU | NST | 764 | 26,593 |

Note that the above database wattage doesn't include gear wattage, because this is recorded incorrectly.

1.7. Authorisation Received

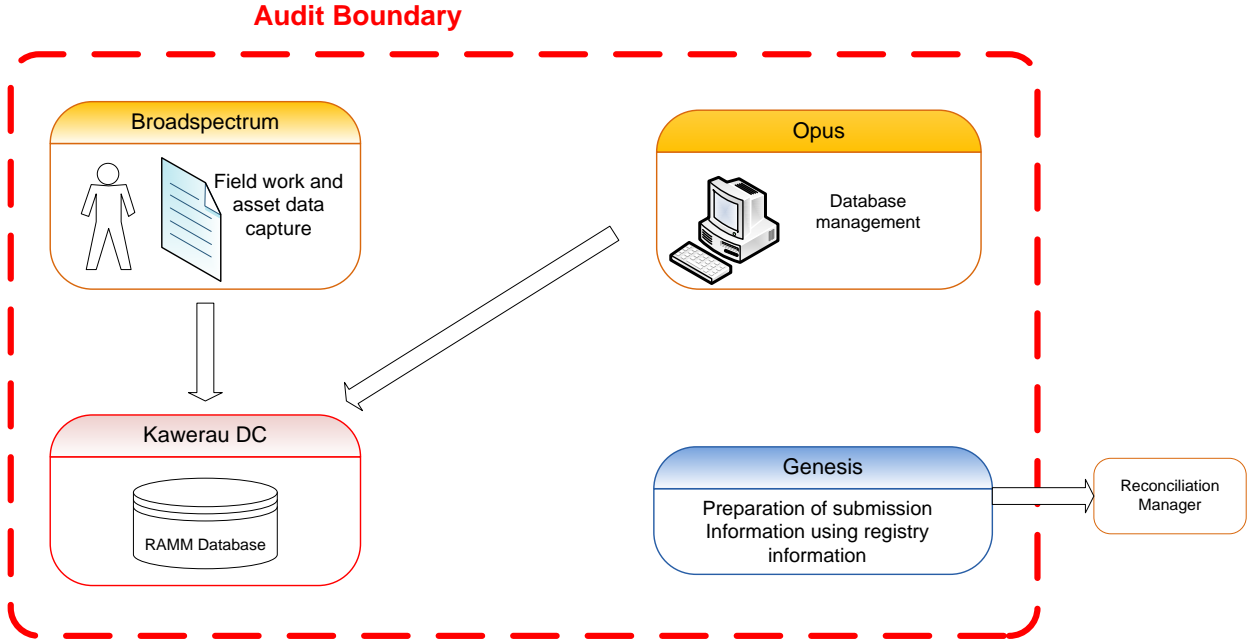
All information was provided directly by Genesis or KDC.

1.8. Scope of Audit

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

Genesis use the daily kWh figure recorded in the registry to reconcile this load. The registry figure was last changed in September 2019. A RAMM database is managed by KDC in relation to this load. I compared the field findings to the database records.

The database is remotely hosted by RAMM Software Ltd. The field work is carried out by Broadspectrum. The asset data capture and database population are conducted by Opus. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The diagram below shows the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 284 items of load.

1.9. Summary of previous audit

NON-COMPLIANCES

| Subject | Section | Clause | Non-Compliance | Status |
|---|---------|----------------------------------|--|----------------|
| DUML Audit | 1.10 | 17.295F of part 17 | Audit not completed within 12 months of Part 16A coming into effect. | Cleared |
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | Historic registry figure used for submission RAMM database is not accurate. | Still existing |
| ICP Identifier | 2.2 | 11(2)(a) & (aa) of Schedule 15.3 | ICP is not recorded in the database. | Still existing |
| Location of each item of load | 2.3 | 11(2)(b) of Schedule 15.3 | 17 items of load with insufficient location details. | Still existing |
| Description and capacity of each item of load | 2.4 | 11(2)(c)&(d) of Schedule 15.3 | 71 items of load with no lamp description, wattage and ballast recorded. 146 items of load with no lamp and ballast wattage recorded. 30 items of load with no ballast recorded. | Still existing |

| Subject | Section | Clause | Non-Compliance | Status |
|-------------------------------|---------|-------------------------|---|----------------|
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3 | 79 lights not included in the database extract. | Still existing |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | <p>The database accuracy is assessed to be 113.5% indicating potential under submission of 23,500 kWh per annum if the database were used for submission.</p> <p>Lamp wattage recorded as ballast wattage indicating an estimated over submission of 79,048 kWh of over submission if the database were used for submission.</p> <p>218 items of load with missing wattage values indicating an estimated under submission of 26,758 kWh if the database were used for submission.</p> <p>Festive lighting is connected but the volume is not recorded.</p> | Still existing |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | Historic registry figure used for submission. | Still existing |

RECOMMENDATIONS

| Subject | Section | Clause | Recommendation | Status |
|-------------------------|---------|------------------------|--------------------------------|----------------|
| Tracking of load change | 2.6 | 11(3) of Schedule 15.3 | Record festive lights in RAMM. | 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

Genesis have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The registry daily kWh figure (assuming burn hours of 11.9) is used to calculate submission. I confirmed the calculation was correct. This figure was recently updated. Genesis have been provided with a wattage report but found the data quality to be too poor to use for submission purposes. They intend to use the KDC data once the database accuracy can be confirmed. KDC had undertaken a 100% field audit to update the RAMM database but this data has not been uploaded to RAMM. KDC will send a monthly wattage reports once this has been completed.

I compared the kW value recorded in the registry with the load recorded in the database extract for the month of September 2019 and found:

| ICP Number | Description | September 2019 kW from registry | RAMM kW value September 2019 | September 2019 difference |
|-----------------|------------------------|---------------------------------|------------------------------|---------------------------|
| 1000023043BP177 | Street Lights, KAWERAU | 54.516 | 26.593 | 27.593- |

It is not possible to determine which figure is correct, because analysis of the database (detailed in the table below) found the data quality to be poor, which means that it is not possible to calculate accurately what the difference is between the field and the figures being used calculate submission.

The following accuracy issues are present:

- 183 items of load (24%) do not have wattage recorded
- 183 items of load do not have gear wattage recorded
- Gear wattage is the same as lamp wattage and is therefore incorrect
- The field audit found that the kW from the field sample was 50.2% higher than the database kW

These issues are detailed in **sections 2.2,2.4** and **3.1**.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|--|-----------------|------------------------|
| Audit Ref: 2.1 Clause 11(1) of Schedule 15.3 From: 30-Jun-18 To: 16-Oct-19 | <p>Historic registry figure used for submission.</p> <p>RAMM database is not accurate.</p> <p>Potential impact: High</p> <p>Actual impact: High</p> <p>Audit history: Once</p> <p>Controls: Weak</p> <p>Breach risk rating: 9</p> | | |
| Audit risk rating | Rationale for audit risk rating | | |
| High | <p>The controls are rated as weak because the RAMM database is not used for reconciliation and there has been no change since the last audit.</p> <p>The impact is assessed to be high due to the registry figure being used, and the RAMM database accuracy being poor.</p> | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| Genesis has already engaged with KDC to receive the database information to enable submission/billing to be based off KDC database information. Due to current submission process being non-compliant Genesis has changed to the database as @ September 2019 to meet this requirement. Genesis will update the registry daily kWh figure based on the monthly reporting provided by KDC with any exception defaulted or corrected, as this figure is used in their billing process. | | 01/09/2019 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Database information has been requested to be delivered monthly. | | 01/09/2019 | |

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 DUMML database must contain:

- each ICP identifier for which the retailer is responsible for the DUMML
- 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

The ICP is not recorded in the database. There is only one ICP associated with this database therefore there is no material impact.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|---|-----------------|------------------------|
| Audit Ref: 2.2 Clause 11(2)(a) & (aa) of Schedule 15.3 From: 01-Jun-17 To: 16-Oct-19 | ICP is not recorded in the database. Potential impact: None Actual impact: None Audit history: None Controls: Weak Breach risk rating: 3 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Low | The controls are rated as weak as the RAMM database does not hold the ICP. The impact is assessed to be low as there is only one ICP associated with this database. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| Genesis has already requested the ICP 1000023043BP177 be updated in RAMM against each asset. | | 01/11/2019 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Genesis reviews monthly data that will be provided by the council | | 01/09/2019 | |

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 DUMML database must contain the location of each DUMML item.

Audit observation

The databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the street address and also GPS coordinates. 27 items of load did not have a street number or GPS coordinates.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|---|---|-----------------|------------------------|
| Audit Ref: 2.3 Clause 11(2)(b) of Schedule 15.3 From: 01-Jun-17 To: 16-Oct-19 | 27 items of load with insufficient location details. 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 rated as moderate as the location is recorded for all but 27 items of load. The impact is assessed to be low as there are only 27 items of load with insufficient location details. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| Genesis has already requested the locational details be updated in RAMM for each asset. | | 31/03/2020 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Genesis reviews monthly data that will be provided by the council | | 01/09/2019 | |

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 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 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 database contains fields for the manufacturers rated wattage and the ballast wattage. The extract provided has fields for lamp and gear make and model. Analysis found there were:

- 29 items of load with no lamp descriptions, lamp wattage and ballast detailed
- 183 items of load with no lamp wattage or ballast wattage recorded

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

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|--|-----------------|------------------------|
| Audit Ref: 2.4 Clause 11(2)(c)&(d) of Schedule 15.3 From: 01-Jun-17 To: 16-Oct-19 | 29 items of load with no lamp descriptions, lamp wattage and ballast detailed 183 items of load with no lamp wattage or ballast wattage recorded Potential impact: Low Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 6 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Medium | The controls are rated as weak the data quality indicates a lack of quality control to check the data being loaded. The impact is assessed to be medium as overall volume of load is small. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| Genesis has already requested the field audit information be updated in RAMM. Genesis defaults any missing lamp information to 150w HPS. | | 31/03/2020 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Genesis reviews monthly data that will be provided by the council, Genesis makes any corrections prior to submission/billing. | | 01/09/2019 | |

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 284 items of load.

Audit commentary

The field audit discrepancies were numerous, and a spreadsheet of the findings has been supplied with this report. The table below shows a summary of findings.

| Finding | Quantity |
|--|----------|
| Lights missing from the database | 41 |
| Lights missing from the field | 9 |
| Incorrect or missing wattage in database | 38 |

This clause relates to lights in the field that are not recorded in the database. The field audit found 41 additional lights. The accuracy of the field audit 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: unknown To: 16-Oct-19 | 41 lights not included in the database extract. Potential impact: Medium Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 6 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Medium | The controls are rated as weak the data quality indicates a lack of quality control to check the data being inputted. The impact is rated as medium as the actual impact is unknown as the registry figure is being used for reconciliation. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| Genesis has already requested the field audit information be updated in RAMM. | | 31/03/2020 | Identified |

| Preventative actions taken to ensure no further issues will occur | Completion date | |
|---|-----------------|--|
| Genesis reviews monthly data that will be provided by the council, Genesis makes any corrections prior to submission/billing. | 01/09/2019 | |

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 DUMML 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 ability of the database to track changes was assessed and 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 DUMML 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 has a complete audit trail.

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 | Kawerau District Council street lights in and around Kawerau |
| Strata | The database contains 763 items of load in the Kawerau DC area. The processes for the management of all Kawerau DC items of load is the same. I selected the following strata: <ul style="list-style-type: none"> • Roads A-H • Roads I-O • Roads P-Z |
| Area units | I created a pivot table of the roads in each database and used a random number generator in each spreadsheet to select a total of 29 sub-units. |
| Total items of load | 284 items of load were checked. |

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

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 327 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 | 150.2 | Wattage from survey is higher than the database wattage by 50.2% |
| R _L | 130.1 | With a 95% level of confidence it can be concluded that the error could be between 130.1% and 179.7% |
| R _H | 179.7 | |

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 30.1% higher and 79.7% higher 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 13.0 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 8 kW higher to 21 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 57,000 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 34,200 kWh p.a. higher to 90,600 kWh p.a. higher than the database indicates.

| Scenario | Description |
|---|--|
| <p>A - Good accuracy, good precision</p> | <p>This scenario applies if:</p> <ul style="list-style-type: none"> (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 <p>The conclusion from this scenario is that:</p> <ul style="list-style-type: none"> (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome. |
| <p>B - Poor accuracy, demonstrated with statistical significance</p> | <p>This scenario applies if:</p> <ul style="list-style-type: none"> (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. <p>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level</p> |
| <p>C - Poor precision</p> | <p>This scenario applies if:</p> <ul style="list-style-type: none"> (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 <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> |

Lamp description and capacity accuracy

The database was checked against the published standardised wattage table. The RAMM database lamp wattage is recorded as ballast as well. Accurate ballast information is required to achieve compliance.

As detailed in **section 2.4**, analysis of the database found:

- 29 items of load with no lamp descriptions, lamp wattage and ballast detailed
- 183 items of load with no lamp wattage or ballast wattage recorded

Festive lights are connected to the unmetered streetlight circuits but are not tracked in RAMM. I was unable to determine the specific impact on reconciliation, but the volume of lights associated with this is small.

| Description | Recommendation | Audited party comment | Remedial action |
|-------------------------|--------------------------------|---|-----------------|
| Tracking of load change | Record festive lights in RAMM. | Genesis Energy has requested the Council to ensure that tracking of changes is catered for in their database. | Identified |

NZTA lighting

NZTA lighting is included in the database for the urban area and was checked as part of the field audit.

ICP accuracy

ICP is not recorded in the database.

Location accuracy

The database contains fields for the street address and also GPS coordinates. 27 items of load did not have a street number or GPS coordinates.

Change management process findings

The processes were reviewed for ensuring that changes in the field are captured. The field work is carried out by Horizon using Pocket RAMM. The streetlight contract is in the process of being renegotiated. The asset data capture and database population are conducted by Opus. KDC have undertaken a 100% field audit to update the RAMM database but this data hadn't been uploaded to RAMM at the time of this audit. This is expected to greatly improve the database accuracy.

The process for new connections was examined. There has been no new development in the Kawerau district in recent times, but the streetlight contract is expected to ensure that assets are added to the database in a timely manner.

The LED replacement project is largely complete.

KDC have weekly outage patrols in place. The frequency of these patrols is expected to be extended due to the lower failure rate of LED lights.

There are no known private lights connected.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|--|-----------------|------------------------|
| Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 16-Oct-19 | In absolute terms the installed capacity is estimated to be 13.0 kW higher than the database indicates. Lamp wattage is recorded as ballast wattage. 29 items of load with no lamp descriptions, lamp wattage and ballast detailed 183 items of load with no lamp wattage or ballast wattage recorded 27 items of load did not have a street number or GPS coordinates Festive lighting is connected but the volume is not recorded. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| High | The controls are rated as weak the data quality indicates a lack of quality control to check the data being inputted. 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 |
| Genesis has already requested the field audit information be updated in RAMM. Genesis defaults any missing lamp information to 150w HPS. | | 31/03/2020 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Genesis reviews monthly data that will be provided by the council, Genesis makes any corrections prior to submission/billing. | | 01/09/2019 | |

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

- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The registry daily kWh figure (assuming burn hours of 11.9) is used to calculate submission. I confirmed the calculation was correct. This figure was recently updated. Genesis have been provided with a wattage report but found the data quality to be too poor to use for submission purposes. They intend to use the KDC data once the database accuracy can be confirmed. KDC had undertaken a 100% field audit to update the RAMM database but this data has not been uploaded to RAMM. KDC will send a monthly wattage reports once this has been completed.

I compared the kW value recorded in the registry with the load recorded in the database extract for the month of September 2019 and found:

| ICP Number | Description | September 2019 kW from registry | RAMM kW value September 2019 | September 2019 difference |
|-----------------|------------------------|---------------------------------|------------------------------|---------------------------|
| 1000023043BP177 | Street Lights, KAWERAU | 54.516 | 26.593 | 27.593- |

It is not possible to determine which figure is correct, because analysis of the database (detailed in the table below) found the data quality to be poor, which means that it is not possible to calculate accurately what the difference is between the field and the figures being used calculate submission.

The following accuracy issues are present:

- 183 items of load (24%) do not have wattage recorded
- 183 items of load do not have gear wattage recorded
- Gear wattage is the same as lamp wattage and is therefore incorrect
- The field audit found that the kW from the field sample was 50.2% higher than the database kW

Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.2 Clause 15.2 and 15.37B(c) From: 01-Jun-17 To: 16-Oct-19 | Historic registry figure used for submission. RAMM database is not accurate Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9 |
| Audit risk rating | Rationale for audit risk rating |
| High | The controls are rated as weak because the RAMM database is not used for reconciliation and there has been no change since the last audit. The impact is assessed to be high due to the registry figure being used, and the RAMM database accuracy being poor. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|--|-----------------|------------------------|
| <p>Ref 3.1 Wattage survey > than database wattage by 50.2% - Genesis believes that their use of historical registry information and an update based off KDC RAMM extraction with exceptions, has meant that Genesis Energy's settlements and billing has been more in line with actual field wattages than the database was prior. The use of this information was more accurate than the dataset for historical periods and moving forward this information can only get more accurate with the updates that KDC will be making.</p> | 31/03/2020 | Identified |
| Preventative actions taken to ensure no further issues will occur | Completion date | |
| <p>Genesis reviews monthly data that will be provided by the council, Genesis makes any corrections prior to submission/billing.</p> | 01/09/2019 | |

CONCLUSION

Genesis use the daily kWh figure recorded in the registry to reconcile this load. Genesis have been provided with a wattage report but found the data quality to be too poor to use for submission purposes. Genesis intend to move to the KDC data once the database accuracy is confirmed. KDC have undertaken a 100% field audit to update the RAMM database but this data hadn't been uploaded to RAMM at the time of this audit. KDC will send a monthly wattage reports once this has been completed.

Analysis of the database found:

- Missing wattage values
- Lamp wattages recorded as ballast values
- A large volume of additional lights found in the field audit.
- A large proportion of incorrect wattages in the database

The combination of these factors means that it is not possible to calculate accurately the difference between the registry figure used for submission, and what is installed in the field.

This audit found seven non-compliances and makes one recommendation. The future risk rating of 44 indicates that the next audit be completed in three months, but I recommend that the next audit be in six months to allow time for remedial actions.

PARTICIPANT RESPONSE

Genesis Energy will address the database issues with KDC, with the intent to have the issues outlined corrected and database maintained. Genesis Energy's use of historical registry information has meant that settlements has been more in line with actual field wattage. The recommendation that a 6 month review period will enable the council to progress with their database updates, based off the 100% field audit being completed.

