

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

KAIKOURA DISTRICT COUNCIL
AND MERCURY ENERGY
NZBN: 9429041941881

Prepared by: Claire Stanley

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Date audit report completed: 12 May 2023

Audit report due date: 01 March 2023

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EXECUTIVE SUMMARY

This audit of the **Kaikoura District Council (KDC)** DUML database and processes was conducted at the request of **Mercury Energy Limited (Mercury)**, 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.

KCC was switched to the MEEN code on October 1st, 2022. This audit examines submission since it switched to the MEEN participant code.

Kaikoura DC is located on the Mainpower network. Mainpower is engaged as the streetlighting maintenance contractor.

The data for submission is recorded in RAMM. Mercury reconciles the KCC DUML load using the HHR profile in accordance with exemption 233.

I compared the KDC databases provided to the submission information provided by Mercury for the month of November 2022 and found it matched.

KDC have completed a full LED roll-out and they have implemented a new dimming profile. All lights are on the 25% dimming profile, and they are dimmed for all of the hours that they are on. The system that is used to control the dimming is 'Schreder EXEDRA'. Mercury have confirmed that the data they use for submission is based on the database wattage, and they are not applying the 25% dimming profile. They are working with KDC currently to confirm if a golden meter has been installed.

A field audit was conducted of a statistical sample of 105 items of load. The "database auditing tool" was used to analyse the results. In absolute terms the installed capacity is estimated to be 1 kW lower than the database indicates. Non-compliance is recorded because the potential error is greater than 5.0%.

- in absolute terms the installed capacity is estimated to be 1 kW lower than the database indicates.
- there is a 95% level of confidence that the installed capacity is up to 2 kW lower than the database.
- in absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.
- there is a 95% level of confidence that the annual consumption is between 7,100 kWh to 200 kWh p.a. lower than the database indicates.

A recommendation from the last audit is repeated to review and correct naming conventions and spelling of roads to remove duplicate entries for roads.

The future risk rating of 21 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided by Mercury and I recommend the next audit is conducted in six months.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|-----------------------------------|---------|------------------------------------|---|----------|-------------------|--------------------|-----------------|
| Distributed unmetered load audits | 1.10 | 16A.26 and 17.295F) | Late submission of report. | Weak | Low | 3 | Identified |
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Submission is based on database wattage and does not account for the new 25% dimming profile, resulting in an approximate over submission of 16,677 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.</p> | Weak | Medium | 6 | Identified |
| ICP identifier and items of load | 2.2 | 11(2)(a) and (aa) of Schedule 15.3 | No items of load have the ICP recorded against them in the database. | Weak | Low | 3 | Identified |
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3) | One additional light found in the field of the sample of 105 items of load checked. | Strong | Low | 1 | Identified |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates. | Moderate | Low | 2 | Identified |

| Subject | Section | Clause | Non-Compliance | Control s | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|-----------------------------------|-----------|--------------------|---|-----------|-------------------|--------------------|-----------------|
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Submission is based on database wattage and does not account for the new 25% dimming profile, resulting in an approximate over submission of 16,677 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.</p> | Weak | Medium | 6 | Identified |
| Future Risk Rating | | | | | | 21 | |
| Future risk rating | 0 | 1-4 | 5-8 | 9-15 | 16-18 | 19+ | |
| Indicative audit frequency | 36 months | 24 months | 18 months | 12 months | 6 months | 3 months | |

RECOMMENDATIONS

| Subject | Section | Recommendation |
|-------------------------------|---------|--|
| Location of each item of load | 2.3 | Review and correct the naming conventions and spelling of roads to remove duplicate entries for roads. |

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

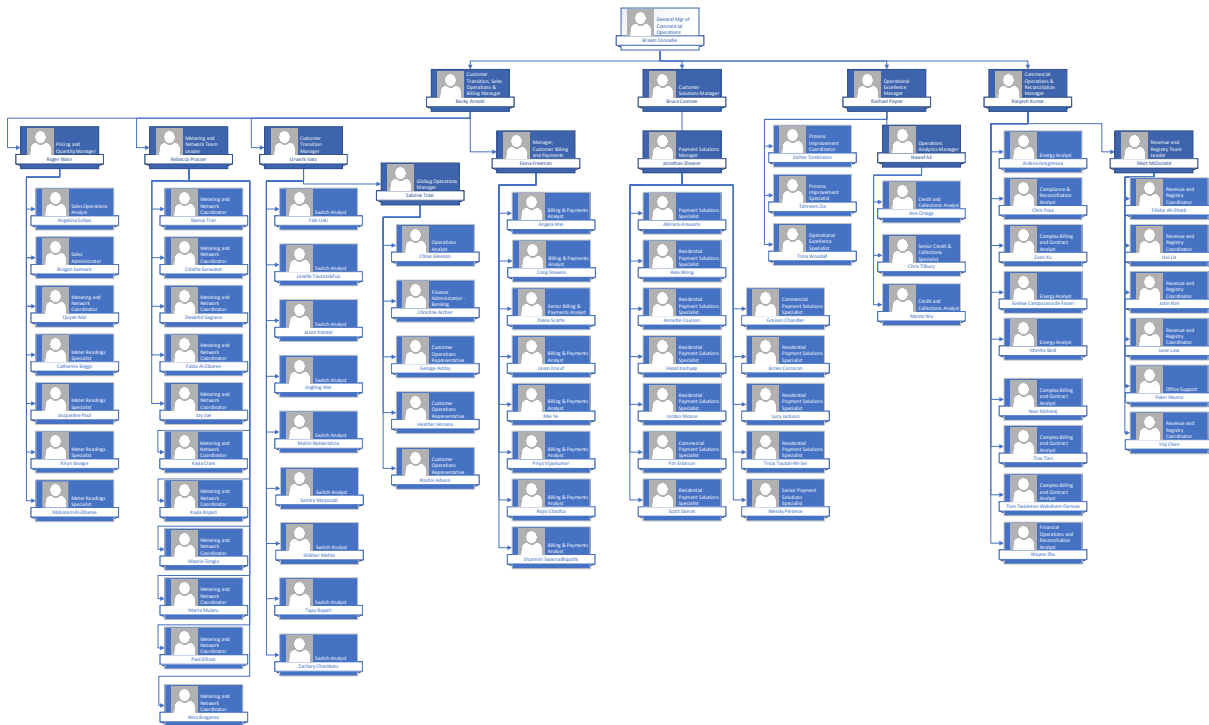
The Electricity Authority’s website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

Mercury has been granted exemption No. 233. This allows them to provide half-hour (“HHR”) submission information instead of non-half-hour (“NHH”) submission information for distributed unmetered load (“DUML”). This exemption expires on 31 October 2023.

1.2. Structure of Organisation

Mercury provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

| Name | Company | Role |
|----------------|-----------------|--------------------|
| Claire Stanley | Veritek Limited | Lead Auditor |
| Rebecca Elliot | Veritek Limited | Supporting Auditor |

Other personnel assisting in this audit were:

| Name | Title | Company |
|--------------|-----------------------------------|---------------------------|
| Chris Posa | Compliance Reconciliation Analyst | Mercury |
| Olga Joensuu | Technical Services Manager | Kaikoura District Council |

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as “RAMM” which stands for “Road Assessment and Maintenance Management”. The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

The database is backed-up in accordance with standard industry procedures. Access to the database is secure by way of password protection.

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

| ICP Number | Description | NSP | Profile | Number of items of load | Database wattage (watts) |
|-----------------|--|---------|---------|-------------------------|--------------------------|
| 0000366411MPF89 | Kaikoura District Council – Streetlighting | CUL0661 | HHR | 387 | 31,480 |
| Total | | | | 387 | 31,480 |

1.7. Authorisation Received

All information was provided directly by Mercury and KDC.

1.8. Scope of Audit

This audit of the Kaikoura District Council (KDC) DUML database and processes was conducted at the request of Mercury Energy Limited (Mercury), 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.

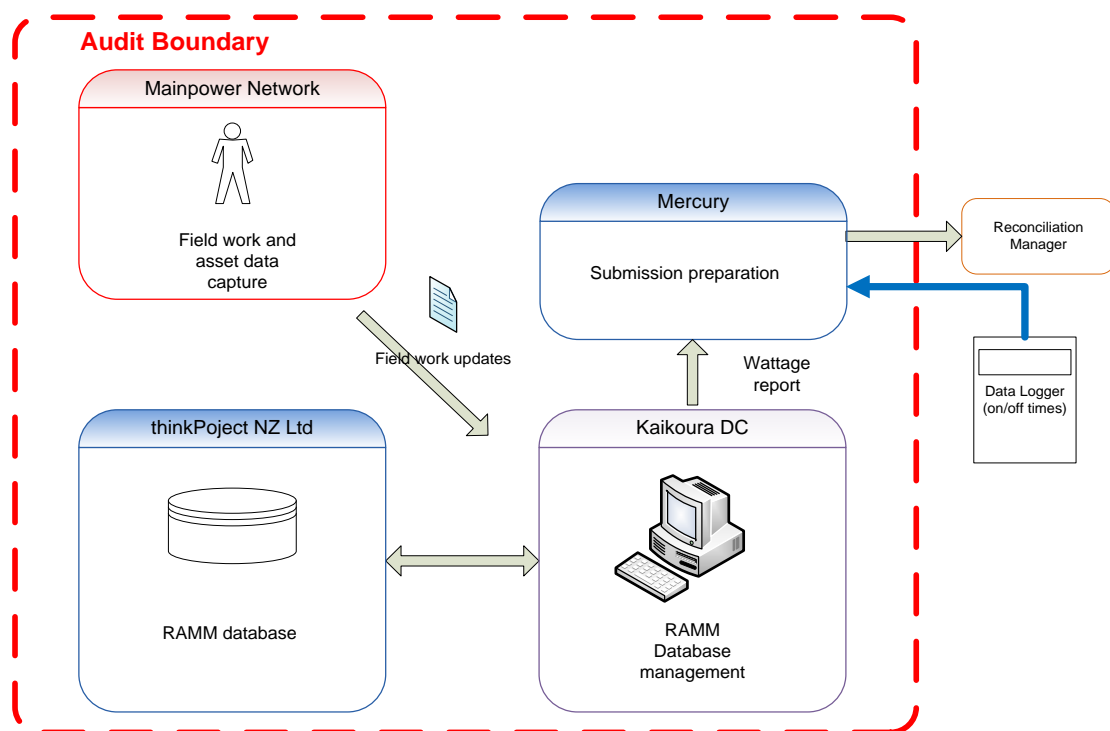
Mercury use KDC's RAMM database for submission. KDC provide a monthly report to Mercury of this database.

Mercury reconciles the KCC DUML load using the HHR profile in accordance with exemption 233. Wattages for the RAMM database are derived from a RAMM database extract. On and off times are derived from a data logger.

Kaikoura DC is located on the Mainpower network. New connection, fault, and maintenance work is completed by Mainpower. The RAMM database is updated by KDC Roding Engineer.

KDC took over management of the database from Mainpower in 2021.

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



The field audit was undertaken of a statistical sample of 105 items of load on 14th April 2023.

1.9. Summary of previous audit

The previous audit was completed in June 2021 by Steve Woods of Veritek Limited. That audit found three non-compliances and made two recommendations. The current status of that audit's findings is detailed below:

Table of Non-Compliance

| Subject | Section | Clause | Non-compliance | Status |
|---------------------------------|---------|------------------------|---|----------------|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | 11 items of permanent load have the incorrect ballast applied indicating a very minor estimated over submission of 279 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 |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | 11 items of permanent load have the incorrect ballast applied indicating a very minor estimated over submission of 279 kWh per annum. | Cleared |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | 11 items of permanent load have the incorrect ballast applied indicating a very minor estimated over submission of 279 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 |

| Subject | Section | Recommendation | Status |
|---------------------------------|---------|---|----------------|
| Location of each item of load | 2.3 | Review and correct the naming conventions and spelling of roads to remove duplicate entries for roads. | Still existing |
| Deriving submission information | 2.1 | Review the 22 LED light types in the Streetlight wattage value table that contain a value for ballast. I recommend changing the lamp wattage to the correct value in the table and remove the reference to ballast for these lamps. | 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

Mercury 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. The report is submitted late due to KDC personnel being on parental leave and only available intermittently to provide information for the audit.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|--|-----------------|------------------------|
| Audit Ref: 1.10 With: Clause 16A.26 and 17.295F From: 15-Apr-21 To: 11-Apr-23 | Late submission of report Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Low | The controls are rated as weak because of limited availability of personnel. The impact is assessed to be low as there is no impact to submission. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| We encountered delays in receiving data that was usable for the purposes of submission; we could not complete the audit until we were able to receive usable data and complete a submission. Delays were compounded by Kaikoura DC having a relatively new staff member looking after DUML and being unable to assist when the staff member was on leave. We kept the EA informed of the delays. | | May 2023 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| N/A | | N/A | |

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

The process for calculation of consumption was examined.

Audit commentary

KDC was switched to the MEEN code on October 1st, 2022. The data for submission is recorded in RAMM. Mercury reconciles the KCC DUML load using the HHR profile in accordance with exemption 233.

I compared the KDC databases provided to the submission information provided by Mercury for the month of November 2022 and found it matched.

KDC have completed a full LED roll-out. They have implemented a new dimming profile. All lights are on the 25% dimming profile, and they are dimmed for all of the hours that they are on. The system that is being used to control the dimming is 'Schreder EXEDRA'. Mercury have confirmed that the data they use for submission is based on the database wattage, and they are not applying the dimming profile. They are working with KDC currently to confirm if a golden meter has been installed.

| Database value submitted (kWh) | 25% dimming profile (kWh) |
|--------------------------------|---------------------------|
| 5,558.8171 | 1,390.00 |

This equates to an estimated over submission of 16,677 kWh pa.

Festive lights are maintained separately in an Excel spreadsheet, and connection dates are provided to Mercury so that they can be included in submissions when connected and excluded when disconnected.

The field audit confirmed that the database accuracy is not within the allowable +/-5% threshold.

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 data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|---|--|-----------------|------------------------|
| Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 15-Apr-21 To: 11-Apr-23 | The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Submission is based on database wattage and does not account for the new 25% dimming profile, resulting in an approximate over submission of 16,677 kWh per annum. In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Weak Breach risk rating: 6 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Medium | The controls are rated as weak because the new dimming profile is not being applied. The impact is assessed to be medium due to the impact of over submission. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| We will advise Kaikoura DC to update the database and are working with them so that we can account for dimming in our submissions. | | July 2023 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| We have new processes in place so that we are fully aware before a DUML customer switches to us of whether they have dimming and whether they already have the requirements for dimming so appropriate action can be taken to ensure that we are submitting accurately. | | March 2023 | |

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

No items of load have the ICP recorded against them in the database.

Audit outcome

Non-compliant

| Non-compliance | Description | |
|---|---|------------------------|
| Audit Ref: 2.2 With: (Clause 11(2)(a) and (aa) of Schedule 15.3) From: 15-Apr-21 To: 11-Apr-23 | No items of load have the ICP recorded against them in the database. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3 | |
| Audit risk rating | Rationale for audit risk rating | |
| Low | The controls are rated as weak because the ICP is not recorded in the database. The impact is assessed to be low as there is only one ICP so there is no impact on submission. | |
| Actions taken to resolve the issue | Completion date | Remedial action status |
| We will advise Kaikoura DC to update this in the database. | June 2023 | Identified |
| Preventative actions taken to ensure no further issues will occur | Completion date | |
| Kaikoura DC are aware of the importance of the database being accurate. | Ongoing | |

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

Audit commentary

The RAMM database contains a field for the nearest street address and GPS coordinates. The street name and GPS co-ordinates are populated for all items of load.

The recommendation from the last audit to review and correct the naming conventions to remove duplicate entries for roads, where roads were recorded with differing spellings of the same name, e.g.,

Whitby Pl and Whitby Place, Brighton St and Brighton Street, Westend and West End has not been actioned. I repeat this recommendation.

| Subject | Section | Recommendation | Status |
|-------------------------------|---------|--|--|
| Location of each item of load | 2.3 | Review and correct the naming conventions and spelling of roads to remove duplicate entries for roads. | We have recommended to Kaikoura DC that they review their database and do a cleanse/tidy-up. |

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 DUMML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that all items of load were recorded.

Audit commentary

The extract provided has fields for lamp model and lamp wattage, which records the total wattage for the lamp, all were populated. All of the lamps recorded are LED, no ballast is required to be recorded.

The accuracy of the lamp wattages and ballasts 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 DUMML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of 105 items of load on 14th April 2023 using the statistical sampling methodology.

Audit commentary

The field audit discrepancies found are detailed in the table below.

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|------------------|----------------|-------------|-------------------------|------------------------------|---|
| Ocean Ridge | 22 | 22 | | 1 | 1 x 27W LED is recorded in the database, but 1 x 30W LED was located in the field. |
| Kotare Place | 9 | 9 | | 2 | 2 x 120W LED is recorded in the database, but 2 x 30W LED was located in the field. |
| South Bay Parade | 19 | 20 | +1 | 1 | 1 x 27W LED is recorded in the database, but 1 x 30W LED was located in the field. 1 additional 30W LED not recorded in the database but located in the field |
| Total | 50 | 51 | 1 | 4 | |

One additional item of load was identified in the field of the 105 items of load sampled. The database accuracy 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: 15-Apr-21 To: 11-Apr-23 | One additional light found in the field of the sample of 105 items of load checked. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Low | The controls are recorded as strong because they mitigate risk to an acceptable level. The impact is assessed to be low due to one additional light found in the field in relation to the overall count of the items of load. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| We will advise Kaikoura DC to update this in the database. | | June 2023 | Identified |
| Preventative actions taken to ensure no further issue will occur | | Completion date | |
| Kaikoura DC are aware of the importance of the database being accurate. | | 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.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The database was checked for audit trails.

Audit commentary

RAMM records audit trail information of changes made.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

A database extract was provided, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

| Plan Item | Comments |
|---------------------|--|
| Area of interest | Kaikoura DC region |
| Strata | <p>The database contains items of load in Kaikoura, excluding NZTA.</p> <p>The area has three distinct sub regions of Kaikoura town, South Bay and the Ocean View subdivision on the way into Kaikoura.</p> <p>The processes for the management of Kaikoura DC items of load are the same, but I decided to place the items of load into three strata, as follows:</p> <ol style="list-style-type: none"> 1. S1 2. S2 3. S3 |
| 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 27 sub-units (roads). |
| Total items of load | 105 items of load were checked. |

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

Audit commentary

Field Audit Findings

A field audit was conducted of a statistical sample of 105 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 | 95.9 | Wattage from survey is lower than the database wattage by 4.1% |
| R _L | 89.5 | With a 95% level of confidence, it can be concluded that the error could be between -10.5% and 0.3% |
| R _H | 100.3 | |

These results were categorised in accordance with the “Distributed Unmetered Load Statistical Sampling Audit Guideline”, effective from 1 February 2019 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% lower and 0.3% 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 1 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is up to 2 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 7,100 kWh to 200 kWh p.a. lower than the database indicates.

| Scenario | Description |
|--|--|
| A - Good accuracy, good precision | <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. |
| B - Poor accuracy, demonstrated with statistical significance | <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> |
| C - Poor precision | <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

Wattage for all items of load were checked against the published standardised wattage table produced by the Electricity Authority in the database and found all wattages were correct.

Change management process findings

Mainpower are responsible for the Network new connections and maintenance. As changes occur in the field the contractor provides a hard copy form to Mainpower, and this information is then provided to KDC and updated by the Roding Engineer in RAMM and in the CMS. For new subdivisions, a Mainpower inspector completes a form per light at the time of livening.

The CMS system contains a subset of the light information held in RAMM, this system is used control the lights and identify any faulty lights.

KDC do not conduct outage patrols, outages are able to be identified through the CMS system.

KDC have recently completed a full roll out of LED lights.

Festive lights are maintained separately in an Excel spreadsheet, and connection dates are provided to Mercury so that they can be included in submissions when connected and excluded when disconnected.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|---|-----------------|------------------------|
| Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 15-Apr-21 To: 11-Apr-23 | In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2 | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Low | Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low due to the impact on submission. | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| We will advise Kaikoura DC to update the database and are working with them so that we can account for dimming in our submissions. | | July 2023 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Kaikoura DC are aware of the importance of the database being accurate. | | 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 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

KDC was switched to the MEEN code on October 1st, 2022. The data for submission is recorded in RAMM. Mercury reconciles the KCC DUML load using the HHR profile in accordance with exemption 233.

I compared the KDC databases provided to the submission information provided by Mercury for the month of November 2022 and found it matched.

KDC have completed a full LED roll-out. They have implemented a new dimming profile. All lights are on the 25% dimming profile, and they are dimmed for all of the hours that they are on. The system that is being used to control the dimming is 'Schreder EXEDRA'. Mercury have confirmed that the data they use for submission is based on the database wattage, and they are not applying the dimming profile. They are working with KDC currently to confirm if a golden meter has been installed.

| Database value submitted (kWh) | 25% dimming profile (kWh) |
|--------------------------------|---------------------------|
| 5,558.8171 | 1,390.00 |

This equates to an estimated over submission of 16,677 kWh pa.

Festive lights are maintained separately in an Excel spreadsheet, and connection dates are provided to Mercury so that they can be included in submissions when connected and excluded when disconnected.

The field audit confirmed that the database accuracy is not within the allowable +/-5% threshold.

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 data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

| Non-compliance | Description | | |
|--|---|-----------------|------------------------|
| <p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 15-Apr-21 To: 11-Apr-23</p> | <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Submission is based on database wattage and does not account for the new 25% dimming profile, resulting in an approximate over submission of 16,677 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.</p> <p>Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Weak Breach risk rating: 6</p> | | |
| Audit risk rating | Rationale for audit risk rating | | |
| Medium | <p>The controls are rated as weak because the new dimming profile is not being applied.</p> <p>The impact is assessed to be medium due to the impact of over submission.</p> | | |
| Actions taken to resolve the issue | | Completion date | Remedial action status |
| We will advise Kaikoura DC to update the database and are working with them so that we can account for dimming in our submissions. | | July 2023 | Identified |
| Preventative actions taken to ensure no further issues will occur | | Completion date | |
| Kaikoura DC are aware of the importance of the database being accurate. | | Ongoing | |

CONCLUSION

KCC was switched to the MEEN code on October 1st, 2022. This audit examines submission since it switched to the MEEN participant code.

Kaikoura DC is located on the Mainpower network. Mainpower is engaged as the streetlighting maintenance contractor.

The data for submission is recorded in RAMM. Mercury reconciles the KCC DUML load using the HHR profile in accordance with exemption 233.

I compared the KDC databases provided to the submission information provided by Mercury for the month of November 2022 and found it matched.

KDC have completed a full LED roll-out and they have implemented a new dimming profile. All lights are on the 25% dimming profile, and they are dimmed for all of the hours that they are on. The system that is used to control the dimming is 'Schreder EXEDRA'. Mercury have confirmed that the data they use for submission is based on the database wattage, and they are not applying the dimming profile. They are working with KDC currently to confirm if a golden meter has been installed.

A field audit was conducted of a statistical sample of 105 items of load. The "database auditing tool" was used to analyse the results. In absolute terms the installed capacity is estimated to be 1 kW lower than the database indicates. Non-compliance is recorded because the potential error is greater than 5.0%.

- in absolute terms the installed capacity is estimated to be 1 kW lower than the database indicates.
- there is a 95% level of confidence that the installed capacity is up to 2 kW lower than the database.
- in absolute terms, total annual consumption is estimated to be 2,800 kWh lower than the DUML database indicates.
- there is a 95% level of confidence that the annual consumption is between 7,100 kWh to 200 kWh p.a. lower than the database indicates.

A recommendation from the last audit is repeated to review and correct naming conventions and spelling of roads to remove duplicate entries for roads.

The future risk rating of 27 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided by Mercury and I recommend the next audit is conducted in six months.

PARTICIPANT RESPONSE

Mercury has reviewed this report and their comments are contained within the report.