

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

KAIKOURA DISTRICT COUNCIL
AND MERCURY ENERGY
NZBN: 9429041941881

Prepared by: Tara Gannon

Date audit commenced: 2 October 2023

Date audit report completed: 14 November 2023

Audit report due date: 01 December 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.

KDC holds its streetlight information in a RAMM database and the Schreder EXEDRA Centralised Management System (CMS).

MainPower NZ Ltd (MainPower) complete all fieldwork for the KDC streetlights. 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 Roading Engineer in RAMM and in the CMS.

Mercury reconciles this DUML load using the HHR profile. Wattages are derived from the undimmed wattage in a monthly CMS extract provided by KDC, and on and off times are derived from a data logger.

Mercury were granted exemption No. 233, which allowed them to provide half-hour (“HHR”) submission information instead of non-half-hour (“NHH”) submission information for distributed unmetered load (“DUML”). Clause 8(g) of Schedule 15.3 of the Code, which the exemption related to was removed from the Code in 2018, therefore the exemption is no longer valid. Mercury is planning to apply for a new profile which will allow them to continue to submit the DUML load as HHR, and to apply dimming.

All lights KDC is responsible for are LED and have a static 25% dimming profile applied, i.e., they are dimmed by 25% for all hours that they are connected. Mercury is working with KDC to arrange for a golden meter to be installed to verify the CMS data and dimming profile. Once this is complete and an approved static dimming profile is available, Mercury will begin calculating submissions on the validated dimmed wattage and data logger on and off times. In the meantime, Mercury’s submissions are approximately 12,359.21 kWh per annum higher than the expected dimmed volumes.

No inaccuracies were found in the review of the entire database, and the field audit of a statistical sample of 129 items of load found that the database was accurate within $\pm 5\%$.

The future risk rating of 15 indicates that the next audit be completed in 12 months on 1 December 2024. I have considered this in conjunction with the comments provided by Mercury, and I agree with this recommendation.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>Submissions are made using HHR profile.</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 12,359.21 kWh per annum. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Weak	Medium	6	
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	
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Submissions are made using HHR profile.</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 12,359.21 kWh per annum. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Weak	Medium	6	
Future Risk Rating						15	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation
		Nil

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

Current code exemptions were reviewed on the Electricity Authority website.

Audit commentary

Mercury were granted exemption No. 233, which allowed them to provide half-hour (“HHR”) submission information instead of non-half-hour (“NHH”) submission information for distributed unmetered load (“DUML”). Clause 8(g) of Schedule 15.3 of the Code, which the exemption related to was removed from the Code in 2018, therefore the exemption is no longer valid.

Mercury currently submits the DUML load as HHR, which is non-compliant with Clause 8(5) of Schedule 15.3 of the Code, because the DUML load does not meet the requirements for use of the HHR profile:

For any unmetered load at an ICP for which it is responsible, regardless of the category of any metering installation at the ICP, a reconciliation participant must provide non-half-hour submission information to the reconciliation manager unless—

(a) the Authority has approved a profile for the unmetered load that allows the reconciliation participant to provide half hour submission information to the reconciliation manager for the unmetered load; and

(b) the reconciliation participant provides half hour submission information in accordance with the profile.

Mercury is planning to apply for a new profile which will allow them to continue to submit the DUML load as HHR.

1.3. Persons involved in this audit

Auditor:

Name	Role	Company
Tara Gannon	Auditor	Provera

Other personnel assisting in this audit were:

Name	Title	Company
Hugo Martin	Account Manager	Mercury Energy
Chris Posa	Compliance Reconciliation Analyst	Mercury Energy
Olga Joensuu	Technical Services Manager	Kaikoura District Council

1.4. Hardware and Software

RAMM

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.

Access is restricted using logins and passwords.

Schreder EXEDRA CMS

EXEDRA is a cloud based system used to manage streetlight assets including recording an inventory, failure reporting, and managing dimming.

Access is restricted using multiple level authentication and data is encrypted and protected. Schreder manages backup and security processes to ensure that the CMS is secure and available.

Mercury systems

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	383	15,575

1.7. Authorisation Received

All information was provided directly by Mercury and KDC.

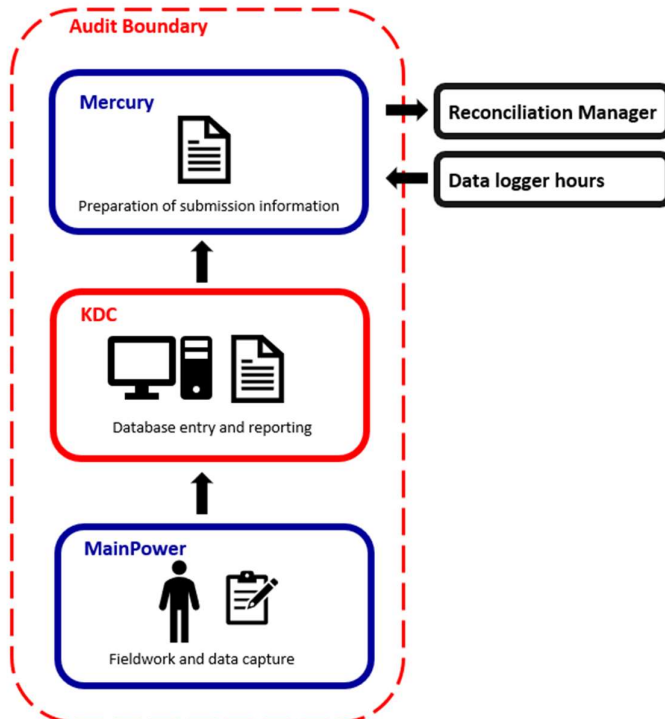
1.8. Scope of Audit

This audit of the KDC DUML database and processes was conducted at the request of 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.

MainPower complete all fieldwork for the KDC streetlights. 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.

Mercury reconciles this DUML load using the HHR profile. Wattages are derived from the undimmed wattage in a monthly CMS extract provided by KDC, and on and off times are derived from a data logger.

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 129 items of load on 11 November 2023.

1.9. Summary of previous audit

The previous audit was completed in May 2023 by Claire Stanley of Veritek Limited. That audit found six non-compliances and made one recommendation. The current status of that audit's findings is detailed below:

Subject	Section	Clause	Non-compliance	Status
Distributed unmetered load audits	1.10	16A.26 and 17.295F)	Late submission of report.	Cleared
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>	<p>Still existing</p> <p>Still existing</p> <p>Cleared</p>
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.	Still existing
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.	Cleared
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.	Cleared
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>	<p>Still existing</p> <p>Still existing</p> <p>Cleared</p>

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.	Adopted.

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 Provera to undertake this streetlight audit.

Audit commentary

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

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

Mercury reconciles this DUML load using the HHR profile. Wattages are derived from the undimmed wattage in a monthly CMS extract provided by KDC, and on and off times are derived from a data logger. No inaccuracies were found in the review of the entire database, and the field audit of a statistical sample of 129 items of load found that the database was accurate within $\pm 5\%$.

Mercury were granted exemption No. 233, which allowed them to provide half-hour (“HHR”) submission information instead of non-half-hour (“NHH”) submission information for distributed unmetered load (“DUML”). Clause 8(g) of Schedule 15.3 of the Code, which the exemption related to was removed from the Code in 2018, therefore the exemption is no longer valid. Mercury is planning to apply for a new profile which will allow them to continue to submit the DUML load as HHR, and to apply dimming.

All lights KDC are responsible for are LED and have a static 25% dimming profile applied, i.e., they are dimmed by 25% for all hours that they are connected. Mercury is working with KDC to arrange for a golden meter to be installed to verify the CMS data and dimming profile. Once this is complete and an approved static dimming profile is available, Mercury will begin calculating submissions on the validated dimmed wattage and data logger on and off times.

I confirmed that submission volumes for July 2023 were calculated from the database extract total before adjustment for dimming, and on hours were based on data logger information. Not taking the dimmed values into account for July resulted in estimated over submission of 1,731.40 kWh for dimmed lights. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission.

Submission volume for July 2023 based on total before dimming	Submission volume for July 2023 based on total after dimming	Over submission of dimmed wattages
6,925.59 kWh	5,194.19 kWh	1,731.40 kWh

The total database wattage on 2 October 2023 was 15,575 W before dimming. Based on all lights being dimmed 25% and 4,271 on hours per annum I estimate annual over submission of dimmed loads to be 12,359.21 kWh per annum.

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: 01-Jul-23 To: 31-Jul-23	Submissions are made using HHR profile. Submission is based on database wattage and does not account for the new 25% dimming profile, resulting in an approximate over submission of 12,359.21 kWh per annum. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6		
Audit risk rating	Rationale for audit risk rating		
Medium	The controls are rated as weak because dimming is not accounted for. 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 are in the process of drafting our profile application which once approved will allow us to be compliant in submitting half hourly data for DUML. As agreed with the EA we will implement the new profile once we move to a new platform which is currently planned for 2024		2024	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
As above		As above	

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

All items of load are connected to 000366411MPF89, but an ICP number is not recorded in the CMS or database extracts provided to Mercury. KDC intends to investigate whether a field can be added to the CMS and/or database extract so that the ICP number can be included.

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: 02-Oct-23	No items of load have the ICP recorded against them in the database. Potential impact: Low Actual impact: Low Audit history: Once 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. There is only one ICP, so there is no impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
KDC investigating with a view to adding the field, we will follow up.		December 2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
As above		As above	

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 CMS contains fields for street address, city, and GPS coordinates. The street name and GPS coordinates are populated for all items of load.

The previous two audits recommended correcting duplicate entries for roads, where roads were recorded with differing spellings of the same name, and this has been completed.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

The CMS records a lamp model and lamp wattage details. The lamp wattage field holds the total wattage, which is the same as the lamp wattage because all lamps are LEDs. Gear models and wattages are not required.

There are no missing or invalid zero lamp models or wattages, and the total wattages are consistent with the lamp model for each item of load.

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 129 items of load on 11 November 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
Killarney Street	5	5	-	1	One 27W LED was recorded in the database as a 30W LED.
Tui Street	3	3	-	1	One 30W LED was recorded in the database as a 27W LED.
Total	129	129	-	2	

Compliance is recorded in this section because no additional items of load were found in the field. The database was found to be accurate within $\pm 5\%$ as discussed in **section 3.1**.

Audit outcome

Compliant

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 and CMS 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 RAMM and CMS database functionality achieves compliance with the code.

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 on 2 October 2023, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Kaikoura DC region
Strata	The database contains 383 items of load in the South Wairarapa DC region. The management process is the same for all lights. I created two strata: <ol style="list-style-type: none"> 1. Road names A-Kn, and 2. Road names Ko-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 29 sub-units (roads).
Total items of load	129 items of load were checked, making up 30% of the total database wattage

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

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

Audit commentary

Field Audit Findings

A field audit was conducted of a statistical sample of 129 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	100.0	Wattage from survey is lower than the database wattage by 4.1%
R _L	99.9	With a 95% level of confidence, it can be concluded that the error could be between -0.1% 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 A (detailed below) applies, and the database is considered to be accurate because the true wattage (installed in the field) could be between 0.1% lower and 0.3% higher than the wattage recorded in the DUML database.

- In absolute terms the installed capacity is estimated to be the same as the database indicates.

- There is a 95% level of confidence that the installed capacity is between 1 kW lower and 2 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be the same as the DUMML database indicates.
- There is a 95% level of confidence that the annual consumption is between 100 kWh lower to 200 kWh p.a. higher than the database indicates.

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

Lamp description and capacity accuracy

CMS records a lamp model and lamp wattage details. The lamp wattage field holds the total wattage, which is the same as the lamp wattage because all lamps are LEDs. Gear models and wattages are not required.

There are no missing or invalid zero lamp models or wattages, and the total wattages are consistent with the lamp model for each item of load.

Change management process findings

KDC holds its streetlight information in a RAMM database and the Schreder EXEDRA CMS. Database extracts provided to Mercury to calculate submissions are produced from CMS.

MainPower complete all fieldwork for the KDC streetlights, including livening of new connections. 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 Roading Engineer in RAMM and in the CMS.

Reports are run from the CMS monthly to identify light outages, and jobs are raised for MainPower to check any affected lights. Light outages are also identified through the faults process. Regular outage patrols do not occur.

LED upgrade

All lights KDC is responsible for are LED and have a static 25% dimming profile applied, i.e., they are dimmed by 25% for all hours that they are connected. Mercury is working with KDC to arrange for a golden meter to be installed to verify the CMS data and dimming profile. Once this is complete and an approved static dimming profile is available, Mercury will begin calculating submissions on the validated dimmed wattage and data logger on and off times. In the meantime submissions are based on the full wattage recorded in the CMS.

Festive lights

KDC does not have any unmetered or metered festive lights.

Private lights

KDC is not aware of any private lights in its region.

Audit outcome

Compliant

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

Mercury reconciles this DUML load using the HHR profile. Wattages are derived from the undimmed wattage in a monthly CMS extract provided by KDC, and on and off times are derived from a data logger. No inaccuracies were found in the review of the entire database, and the field audit of a statistical sample of 129 items of load found that the database was accurate within $\pm 5\%$.

Mercury were granted exemption No. 233, which allowed them to provide half-hour (“HHR”) submission information instead of non-half-hour (“NHH”) submission information for distributed unmetered load (“DUML”). Clause 8(g) of Schedule 15.3 of the Code, which the exemption related to was removed from the Code in 2018, therefore the exemption is no longer valid. Mercury is planning to apply for a new profile which will allow them to continue to submit the DUML load as HHR, and to apply dimming.

All lights KDC is responsible for are LED and have a static 25% dimming profile applied, i.e., they are dimmed by 25% for all hours that they are connected. Mercury is working with KDC to arrange for a golden meter to be installed to verify the CMS data and dimming profile. Once this is complete and an approved static dimming profile is available, Mercury will begin calculating submissions on the validated dimmed wattage and data logger on and off times.

I confirmed that submission volumes for July 2023 were calculated from the database extract total before adjustment for dimming, and on hours based on data logger information. Not taking the dimmed values into account for July resulted in estimated over submission of 1,731.40 kWh for dimmed lights. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission.

Submission volume for July 2023 based on total before dimming	Submission volume for July 2023 based on total after dimming	Over submission of dimmed wattages
6,925.59 kWh	5,194.19 kWh	1,731.40 kWh

The total database wattage on 2 October 2023 was 15,575 W before dimming. Based on all lights being dimmed 25% and 4,271 on hours per annum I estimate annual over submission of dimmed loads to be 12,359.21 kWh per annum.

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</p> <p>With: Clause 15.2 and 15.37B(c)</p> <p>From: 01-Jul-23</p> <p>To: 31-Jul-23</p>	<p>Submissions are made using HHR profile.</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 12,359.21 kWh per annum. Mercury is following a compliant process because they do not have an approved profile which allows them to use the dimmed data for submission.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: Medium</p> <p>Actual impact: Medium</p> <p>Audit history: Multiple times</p> <p>Controls: Weak</p> <p>Breach risk rating: 6</p>
Audit risk rating	Rationale for audit risk rating
Medium	<p>The controls are rated as weak because dimming is not accounted for.</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 are in the process of drafting our profile application which once approved will allow us to be compliant in submitting half hourly data for DUML. As agreed with the EA we will implement the new profile once we move to a new platform which is currently planned for 2024	2024	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
As above	As above	

CONCLUSION

KDC holds its streetlight information in a RAMM database and the Schreder EXEDRA Centralised Management System (CMS).

All lights KDC is responsible for are LED and have a static 25% dimming profile applied, i.e., they are dimmed by 25% for all hours that they are connected. Mercury is working with KDC to arrange for a golden meter to be installed to verify the CMS data and dimming profile. Once this is complete and an approved static dimming profile is available, Mercury will begin calculating submissions on the validated dimmed wattage and data logger on and off times. In the meantime, Mercury's submissions are approximately 12,359.21 kWh per annum higher than the expected dimmed volumes.

No inaccuracies were found in the review of the entire database, and the field audit of a statistical sample of 129 items of load found that the database was accurate within $\pm 5\%$.

The future risk rating of 15 indicates that the next audit be completed in 12 months on 1 December 2024. I have considered this in conjunction with the comments provided by Mercury, and I agree with this recommendation.

PARTICIPANT RESPONSE

Mercury have reviewed this audit report and their comments are contained within its body.