ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

CHRISTCHURCH INTERNATIONAL AIRPORT LIMITED
AND MERIDIAN ENERGY LIMITED
NZBN: 9429038056550

Prepared by: Rebecca Elliot

Date audit commenced: 4 April 2022

Date audit report completed: 3 May 2022

Audit report due date: 11-May-22

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EXECUTIVE SUMMARY

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

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

Meridian reconciles this DUML load using the DST profile. Submissions are based on the database information, with on and off times derived from data logger information.

I checked the March 2022 extract provided by Orion against the submission totals supplied by Meridian and found that submission matched the database.

A full field audit was undertaken and found some additional lights and incorrect wattages. Analysis of these indicate that the database accuracy is estimated to be 4% lower than that recorded in the database. These findings are detailed in **section 2.5.** This will result in an estimated under submission of 3,199 kWh per annum (based on 4,271 hours per annum).

This audit found four non-compliances and makes one recommendation.

The future risk rating of 10 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Meridian's comments and recommend that the next audit be in 12 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
Deriving submission information	2.1	11(1) of Schedule 15.3	The data used for submission does not track changes at a daily basis and is provided as a snapshot. Estimated over submission of 3,199 per annum. 18 x 90W LED lamps not recorded correctly in the database, resulting in 811 kWh of over submission that will not be corrected as it is outside the 14-month revision cycle.	Moderate	Low	2	Identified
All load recorded in the database	2.5	All load recorded in the database	21 additional lights found in the field.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	18 x 90W LED lamps not recorded correctly in the database, resulting in over submission of 1,110 kWh since November 2017. Estimated over submission of 3,199 per annum.	Weak	Low	3	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The data used for submission does not track changes at a daily basis and is provided as a snapshot. Estimated over submission of 3,199 per annum. 18 x 90W LED lamps not recorded correctly in the database, resulting in 811 kWh of over submission that will not be corrected as it is outside the 14-month revision cycle.	Moderate	Low	2	Identified
					Future Risk Rating	**10**	

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

RECOMMENDATIONS

Subject	Section	Recommendation	Action
Database accuracy	3.1	Review the new streetlight processes to ensure changes are notified and updated in the database.	The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

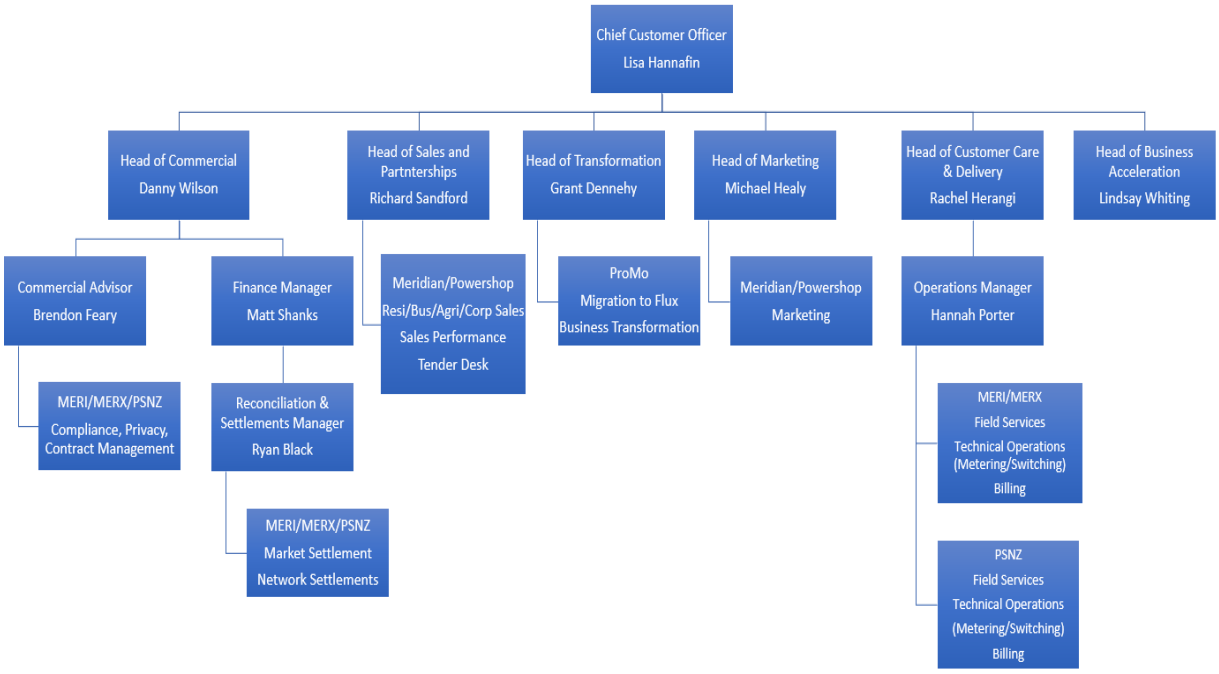
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditors:

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

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Danial Lau	Energy Data Analyst	Meridian Energy
Penny Lawrence	Operations Services	Orion

1.4. Hardware and Software

Orion use a purpose-built Oracle system for the management of the DUML information. Backup and restoration procedures are in accordance with normal industry protocols.

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	Profile	Number of items of load	Database wattage (watts)
0007131634RNDC9	Ref Orion -CIA GXP street light ICP	DST	207	17,627

1.7. Authorisation Received

All information was provided directly by Meridian or Orion.

1.8. Scope of Audit

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

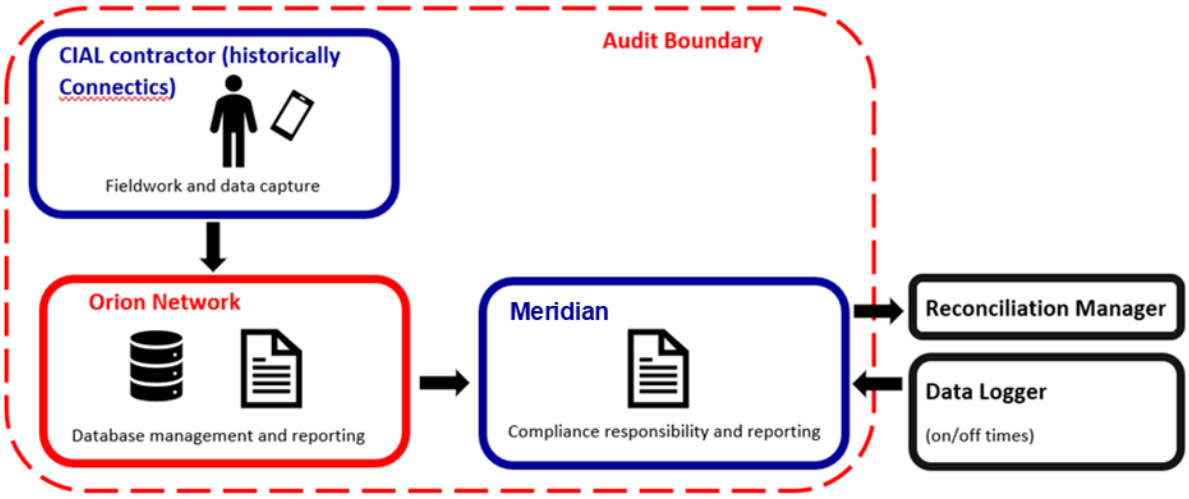
The audit was largely conducted in accordance with the audit guidelines for DUML audits version 1.1.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting.

The CIAL boundary is part of the Orion Network. Orion manage their database for CIAL. Monthly reporting is supplied to Meridian by Orion.

This audit covers the Orion database.

The diagrams below show the audit boundaries for clarity.



1.9. Summary of previous audit

Meridian provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited, completed in May 2020 for Meridian Energy. The table below records the findings.

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Database discrepancies not corrected from last audit resulting in an estimated over submission of 1,755kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Cleared Still existing
Database accuracy	3.1	Clause 15.2 and 15.37B(b)	Database discrepancies not corrected from last audit resulting in an estimated over submission of 1,755kWh per annum.	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database discrepancies not corrected from last audit resulting in an estimated over submission of 1,755kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Cleared 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 3 months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Meridian have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for the Orion 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

Meridian reconciles this DUML load using the DST profile.

Submissions are based on the database information, with on and off times derived from data logger information.

I checked the March 2022 extract provided by Orion against the submission totals supplied by Meridian and found that submission matched the database.

A full field audit was undertaken and found additional lights and incorrect wattages. Analysis of these indicate that the database is estimated to be 4% lower than that recorded in the database. These findings are detailed in **section 2.5.** This will result in an estimated over submission of 3,199 kWh per annum (based on 4,271 hours per annum). This included 18 x 90W LED lamps that were installed in November 2017, which replaced 10 x 150W MH lamps in the field resulting in over submission of 1,110 kWh over 52 months. 299 kWh will be washed up through the 14 month revision cycle, but the remaining 811 kWh will not be corrected.

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: 06-May-20 To: 04-Apr-22	The data used for submission does not track changes at a daily basis and is provided as a snapshot. Estimated over submission of 3,199 per annum. 18 x 90W LED lamps not recorded correctly in the database, resulting in 811 kWh of over submission that will not be corrected as it is outside the 14 month revision cycle. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has advised ORION of the inaccuracies and have requested to be corrected We are considering how we can redesign our processes to incorporate the calculation of volumes at a daily level rather than a monthly snapshot.	11/8/2022 Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner	11/8/2022	

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 an ICP was recorded against each item of load.

Audit commentary

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

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for the street name, number, and GPS coordinates. The street name and GPS coordinates are recorded for all items of load.

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 each item of load had a value recorded in these fields.

Audit commentary

The database contains a lamp type, which corresponds to a lamp total wattage including ballast wattage. All items of load have a lamp type and total wattage recorded. The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of the entire database of 207 items of load on 6th April 2022.

Audit commentary

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

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Bolt Pl				3	3 x 80W MV recorded in the database but 3 x 36W LED located in the field
Deep Freeze Barracks				3	3 x 2*30W FF recorded in the database but 3 x 36W LED located in the field
Deep Freeze Carpark			+10	15	4 x 2*30W FF recorded in the database but 4 x 51W LED located in the field 1 x 2*30W FF recorded in the database but 1 x 70W HPS located in the field 2 x additional 51W LED not recorded in the database but located in the field 10 x 150W MH recorded in the database but 18 x 90W LED lamps located in the field
George Bellew Rd by Ron Guthrey Rd				1	1 x 70W MH recorded in the database but 1 x 85W LED located in the field
Ivan Cr				4	4 x 2*30W FF recorded in the database but 4 x 36W LED located in the field
Ivan Jamieson Pl				3	3 x 80W MV recorded in the database but 3 x 36W LED located in the field
Orchard Rd			+7	9	9 x 61W LED recorded in the database but 9 x 55W LED located in the field 7 x additional 34W LED not recorded in the

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
					database but located in the field
Perimeter Rd			+3		2 x additional 37W LED not recorded in the database but located in the field. 1 x additional 46W LED not recorded in the database but located in the field
Richard Pearse Rd				3	1 x 250W HPS recorded in the database but 1 x 37W LED located in the field 1 x 53W LED recorded in the database but 1 x 75 LED located in the field 1 x182W LED recorded in the database but 145W LED located in the field
Robin Mann Pl				2	2 x 70W HPS recorded in the database but 2 x 36W LED located in the field
Ron Guthrey Rd			+1	4	1 additional 37W LED not recorded in the database but located in the field 2 x 80W MV recorded in the database but 2 x 37W LED located in the field 1 x 70W HPS recorded in the database but 1 x 37W LED located in the field 1 x 80W MV recorded in the database but 1 x 36W LED located in the field
Syd Bradley Rd underpass lights			-2	1	1 x 92W LED recorded in the database but 129W LED located in the field 2 x 92W LED recorded in the database but not located in the field
Wairakei Rd			-1	4	2 x 2*30W FF recorded in the database but 2 x 27W LED located in the field 2 x 2*30W FF recorded in the database but 2 x 36W LED located in the field

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
					1 x 2*30W FF recorded in the database but not located in the field
TOTAL	**207**	**225**	**24 (+21, -3)**	**52**	

The field audit found 21 additional items of load found in the field of items of 207 load sampled. This is recorded as non-compliance below.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 06-May-20 To: 04-Apr-22	21 additional lights found in the field representing a 10% error rate. 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 recorded as weak as the database used for submission has a large number of discrepancies. The impact is assessed to be low due to effect on reconciliation accuracy.

Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has advised ORION of the inaccuracies and have requested to be corrected	11/8/2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner	11/8/2022	

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 Orion 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

Orion demonstrated a complete audit trail of all additions and changes to the database information.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

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

The findings of the field audit undertaken during the last audit were reviewed to determine if the database had been updated.

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

Audit commentary

Database Accuracy and Lamp accuracy

A full field audit was undertaken and found additional lights and incorrect wattages. Analysis of these indicate that the database is estimated to be 4% lower than that recorded in the database. These findings are detailed in **section 2.5.** This will result in an estimated over submission of 3,199 kWh per annum (based on 4271 hours per annum).

The field audit identified 18 x 90W LED lamps that were installed in November 2017, which replaced 10 x 150W MH lamps in the field, resulting in over submission of 1,110 kWh over 52 months. 811 kWh falls outside the 14 month revision cycle.

Lamp description and capacity accuracy

The Orion database was found to have no inaccuracies when compared to the published standardised wattage table.

Change management process findings

Orion's processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. CIAL are responsible for the Network maintenance at CIAL and they can choose their own contractor licensed to work on the Orion Network. Outage patrols are conducted on a regular basis. Lamp outages are notified to CIAL, and work requests are passed to their contractor.

New streetlights require a proposed design to be provided which is then approved by the Orion contract manager. On completion of the work the contractor is required to supply the following documents:

- As-Built - Showing full design including pole and lamp specs,
- LVA – (Low voltage alteration sheet) Outlining Cable size, circuits, cable tests and date of testing etc,
- Test Certs - Lamp ID, location, Tested, Livened (this date is used in DB), GPS Co-ords,
- COC - Certificate of Compliance,
- ROI - record of inspection, and
- Completion Cert from Contractor notifying Orion of completed works,

Orion Completion Cert is issued once all the above is complete.

Once all the above has been received, the As-built/LVA are input into GIS and the streetlight database. I recommend that the new streetlight process is reviewed as there are a large number of changes identified in the field that have not been notified to update the database.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Review the new streetlight processes to ensure changes are notified and updated in the database.	The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 06-May-20 To: 04-Apr-22	18 x 90W LED lamps not recorded correctly in the database, resulting in over submission of 1,110 kWh since November 2017. Estimated over submission of 3,199 per annum. 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 recorded as weak as the database used for submission has a large number of discrepancies. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has advised ORION of the inaccuracies and have requested to be corrected	11/8/2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner	11/8/2022	

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

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

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

Audit observation

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

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

Audit commentary

Meridian reconciles this DUML load using the DST profile.

Submissions are based on the database information, with on and off times derived from data logger information.

I checked the March 2022 extract provided by Orion against the submission totals supplied by Meridian and found that submission matched the database.

A full field audit was undertaken and found additional lights and incorrect wattages. Analysis of these indicate that the database is estimated to be 4% lower than that recorded in the database. These findings are detailed in **section 2.5.** This will result in an estimated over submission of 3,199 kWh per annum (based on 4,271 hours per annum). This included 18 x 90W LED lamps that were installed in November 2017, which replaced 10 x 150W MH lamps in the field, resulting in over submission of 1,110 kWh over 52 months. 299 kWh will be washed up through the 14-month revision cycle, but the remaining 811 kWh will not be corrected.

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: 3.2 With: 15.2 and 15.37B(c) From: 06-May-20 To: 04-Apr-22	The data used for submission does not track changes at a daily basis and is provided as a snapshot. Estimated over submission of 3,199 per annum. 18 x 90W LED lamps not recorded correctly in the database, resulting in 811 kWh of over submission that will not be corrected as it is outside the 14-month revision cycle. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has advised ORION of the inaccuracies and have requested to be corrected	11/8/2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The majority of inaccuracies are due to lack of notification from the contractor (Connetics) regarding new installations and variations from initial designs. Meridian will work with Connetics to provide Orion with the install updates and changes to maintain the database in a timely manner	11/8/2022	

CONCLUSION

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

Meridian reconciles this DUML load using the DST profile. Submissions are based on the database information, with on and off times derived from data logger information.

I checked the March 2022 extract provided by Orion against the submission totals supplied by Meridian and found that submission matched the database.

A full field audit was undertaken and found some additional lights and incorrect wattages. Analysis of these indicate that the database accuracy is estimated to be 4% lower than that recorded in the database. These findings are detailed in **section 2.5.** This will result in an estimated under submission of 3,199 kWh per annum (based on 4,271 hours per annum).

This audit found four non-compliances and makes one recommendation.

The future risk rating of 10 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Meridian's comments and recommend that the next audit be in 12 months.

PARTICIPANT RESPONSE

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