ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WESTERN BAY OF PLENTY DISTRICT COUNCIL
AND GENESIS ENERGY LIMITED

Prepared by: Steve Woods

Date audit commenced: 12 October 2020

Date audit report completed: 5 May 2021

Audit report due date: 22-Dec-20

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EXECUTIVE SUMMARY

This audit of the Western Bay of Plenty District Council (**WBOP DC**) DUML database and processes was conducted at the request of Genesis Energy Limited (**Genesis**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

A RAMM database is managed by Westlink on behalf of WBOP DC in relation to this load. The asset data capture and database population is also conducted by Westlink. The field work is carried out by Horizon.

Genesis was reconciling this DUML load using the UML profile. They have since updated the Registry to DST. A monthly report is sent each month but was not being used for reconciliation. At the time of the audit the registry information was being used for submission, this has since been updated and they are now using the monthly report that is provided and washups are occurring to correct data.

I compared the submission volumes between the load recorded in the database extract and the registry figure for the month of August 2020. There is a minor difference from the wattage recorded in the database, and the registry figure.

In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.

The audit found three non-compliances. The future risk rating of 18 indicates that the next audit be completed in six months, however I recommend a 12-month period to reflect the improvement in data provision to Genesis.

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	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates. 23 items of load with the incorrect wattage recorded resulting in an estimated over submission of 7,901.35kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Identified

Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.	Weak	Medium	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates. 23 items of load with the incorrect wattage recorded resulting in an estimated over submission of 7901.35kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Identified
					Future Risk Rating	**18**	

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

RECOMMENDATIONS

Subject	Section	Description	Recommendation

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

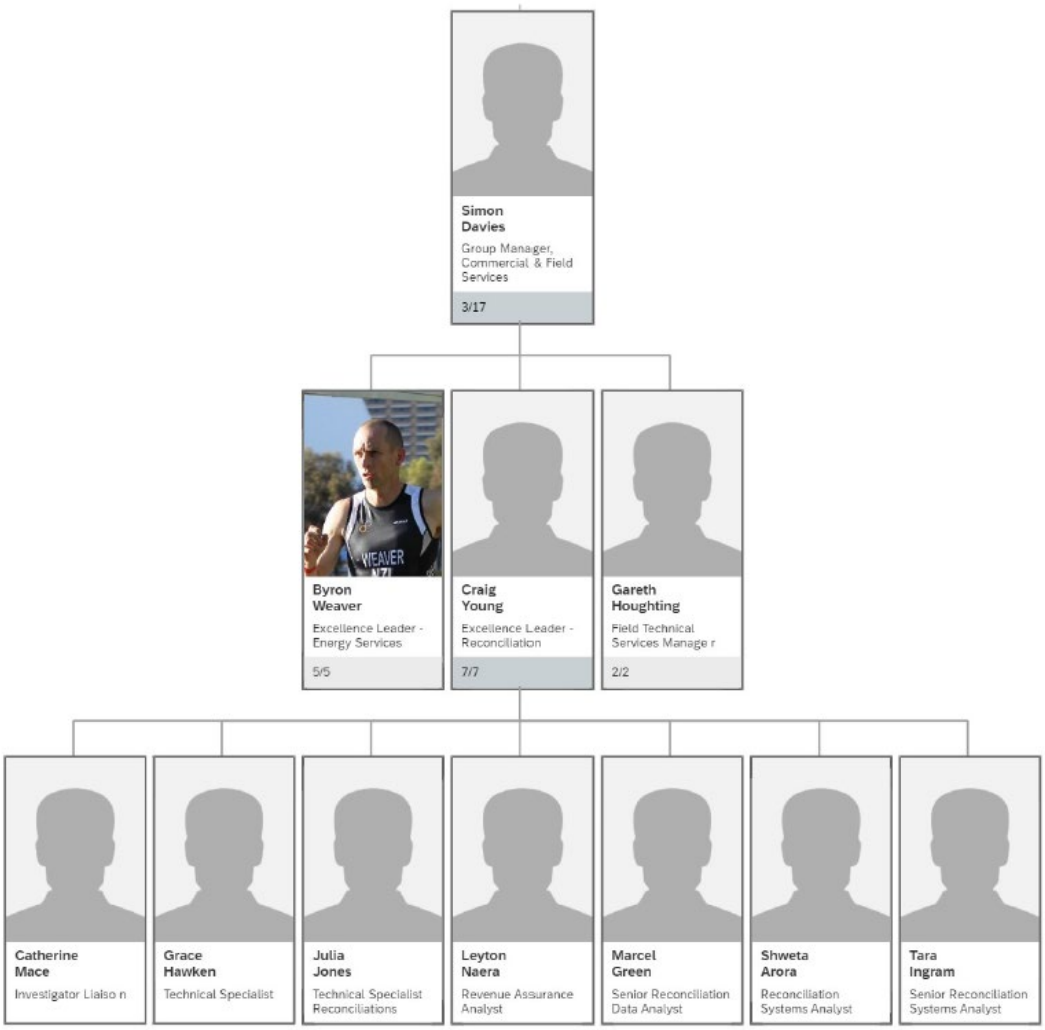
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Genesis provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Steve Woods	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist - Reconciliation Team	Genesis Energy
Phillip Barnes	Maintenance Manager	Westlink BOP

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

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

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

ICP Number	Description	Profile	Number of items of load	Database wattage (watts)
0000557892UNB4E	STREETLIGHTING, WAIHI BEACH, WESTERN BAY OF PLENTY	UNM	538	46,629

1.7. Authorisation Received

All information was provided directly by Genesis or Westlink.

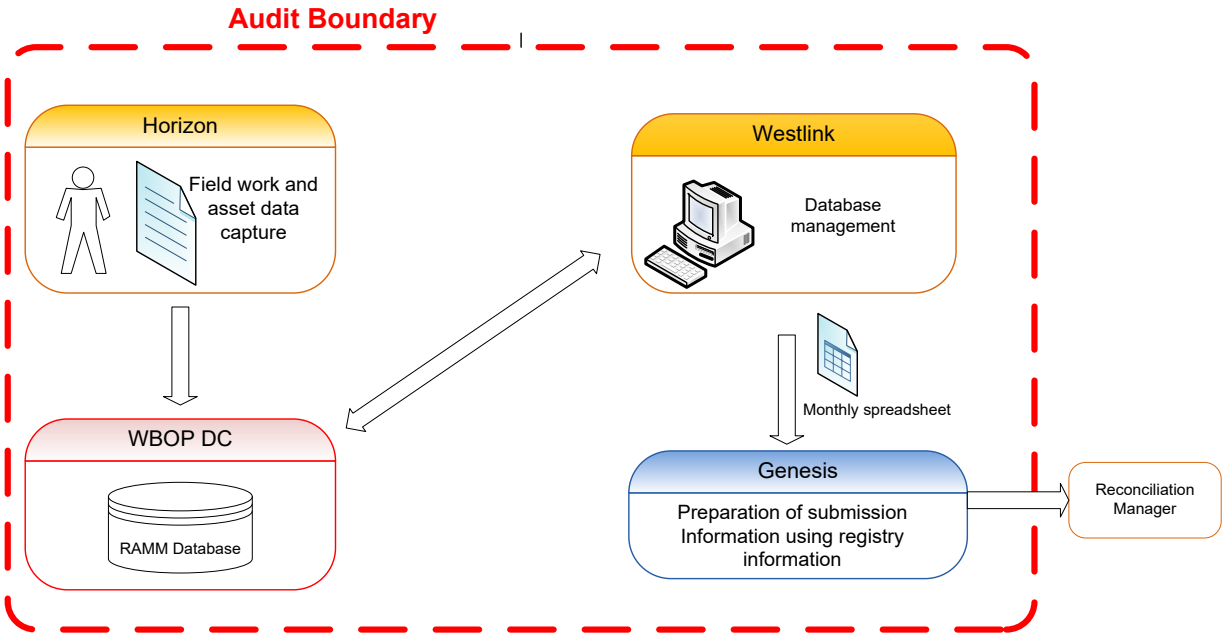
1.8. Scope of Audit

This audit of the Western Bay of Plenty District Council (**WBOP DC**) DUML database and processes was conducted at the request of Genesis Limited (**Genesis**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

A RAMM database is managed by Westlink on behalf of WBOP DC in relation to this load. A monthly report detailing the number of lights and lamp wattage is provided each month by Westlink, but this was not used for reconciliation until very recently.

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



The field audit was undertaken of a statistical sample of 110 items of load on 20th October 2020.

1.9. Summary of previous audit

The previous audit was completed in March 2019 by Rebecca Elliot of Veritek Limited. Four non-compliances were identified, and one recommendation was made. The statuses of the non-compliances and recommendation are described below.

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Monthly database reporting not used for submission resulting in a potential under submission of an estimated 2,450 kWh per annum. New lights not added to the RAMM database within the month of electrical connection. In absolute terms, total annual consumption is estimated to be 4,900 kWh lower than the DUML database indicates.	Cleared Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four lights not recorded in the database.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	New lights are not added to the database for reconciliation in the month they are electrically connected. In absolute terms, total annual consumption is estimated to be 4,900 kWh lower than the DUML database indicates.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	Monthly database reporting not used for submission resulting in a potential under submission of an estimated 2,450 kWh per annum. New lights not added to the RAMM database within the month of electrical connection. In absolute terms, total annual consumption is estimated to be 4,900 kWh lower than the DUML database indicates.	Cleared Still existing

Recommendations

Subject	Section	Description	Recommendation
Tracking of load change	2.6	Liaise with Powerco to determine the most effective process to ensure the volumes associated with new subdivision streetlights are reconciled.	Cleared

1.10.

1.11. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Genesis have requested Veritek to undertake this streetlight audit.

Audit commentary

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

Genesis was reconciling this DUML load using the UML profile. They have since updated the Registry to NST. A monthly report is sent each month but was not being used for reconciliation. At the time of the audit the registry information was being used for submission, this has since been updated and they are now using the monthly report that is provided and washups are occurring to correct data.

I compared the submission volumes between the load recorded in the database extract and the registry figure for the month of August 2020. There is a minor difference from the wattage recorded in the database, and the registry figure.

In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 Clause 11(1) of Schedule 15.3 From: 21-Jan-20 To: 12-Oct-20	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates. 23 items of load with the incorrect wattage recorded resulting in an estimated over submission of 7,901.35kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**

Medium	The controls are rated as weak as the RAMM database was not used for reconciliation for most of the audit period. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	**Completion date**	**Remedial action status**
Gained asset information, provided database improvement recommendations, and working on the provision of monthly extraction to include tracking of change data.	01/03/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested monthly RAMM data to provide Genesis with the asset attributes required to review and provide the customer with exception management reporting. Genesis has also been working with Westlink to find a solution to tracking of changes and the vesting of new connection into the database.	01/03/2021	

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 and festive lights spreadsheet were checked to confirm whether an ICP is recorded for each item of load.

Audit commentary

All items of load in RAMM have an ICP number recorded.

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

Audit commentary

The database contains fields for the street address and GPS coordinates, and all were populated.

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 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

All lamps in RAMM have a lamp model, lamp wattage and gear wattage recorded. No missing, or invalid zero lamp or gear wattages were identified.

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 a statistical sample of 110 items of load on 20th October 2020.

Audit commentary

The field audit discrepancies are detailed in the table below:

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
BONITO AVENUE	1	1		1	1 X 70W SON not found in the field, 1 x LED 23W found
DIDSBURY DRIVE	3	3		3	3 X 70W SON not found in the field, 3 x LED 23W found
HANLEN AVENUE	5	5		5	5 X 70W SON not found in the field, 5 x LED 23W found
LEO STREET	8	8		8	8 X 70W SON not found in the field, 8 x LED 23W found

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
SAVAGE AVENUE	5	5		5	5 X 70W SON not found in the field, 5 x LED 23W found
SCOTT STREET	1	1		1	1 X 70W SON not found in the field, 1 x LED 23W found
Total	110	110		23	

No additional lights were found in the field.

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 database was checked for audit trails.

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

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

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

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

Plan Item	Comments
Area of interest	Western BOP DC Street Lights in the Waihi area
Strata	The databases contain 538 items of load in the Western BOP DC area. The processes for the management of all WBOPDC items of load is the same and therefore I split the data into three relatively even sized data sets using street name to allocate lights between the strata: • Street name A-G • Street name H-R • Street name S-Z
Area units	I created a pivot table of the roads in each database and used a random number generator in each spreadsheet to select a total of 23 sub-units.
Total items of load	110 items of load were checked.

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

Audit commentary

A field audit was conducted of a statistical sample of 110 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	84.9	Wattage from survey is lower than the database wattage by 15.1%
R_L	69.6	With a 95% level of confidence, it can be concluded that the error could be between -30.4% and -4.7%
R_H	95.3	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19 and the table below shows that Scenario C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between -30.4% and -4.7% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 7 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 14 kW to 2 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 60,600 kWh p.a. and 9,500kWh p.a. lower than the database indicates.

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

The database was checked against the published standardised wattage table and confirmed that ballasts applied, and lamp descriptions were correct.

NZTA Lighting

NZTA lighting is not included in this audit.

ICP accuracy

No ICP errors were identified.

Location accuracy

The database contains fields for the street address and GPS coordinates, and all were populated.

Change management process findings

The process to add new streetlights is that WBOP DC approves all new developments and the consent is provided once they are satisfied that the development will meet the required standards. Detailed "as-builts" are required to be provided by the developer and a walk over by council staff of the development is undertaken before the 224 certificate is issued. Once this is issued the "as-builts" should be sent to Westlink to upload to RAMM. This process is slow, and it can take some months before this information reaches Westlink.

Horizon carries out the field maintenance for Westlink on behalf of WBOP DC and they update RAMM directly. Westlink have robust controls in their contract with Horizon and this ensures that field maintenance is captured in a timely and accurate manner. Outage patrols are in place with the whole network being checked each month. Additional to this Westlink undertake a 20% validation of all assets they are responsible for on an annual basis.

WBOP DC have started an LED light update, there was evidence with new LKEDs identified in the field but not yet updated in the database.

There are no festive lights connected to the unmetered streetlight circuits and there are no private lights known of or identified as part of the field audit undertaken.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 21-Jan-20 To: 12-Oct-20	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates. Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak as the RAMM database was not used for reconciliation for most of the audit period. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Gained asset information, provided database improvement recommendations, and working on the provision of monthly extraction to include tracking of change data.	01/03/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

Genesis has requested monthly RAMM data to provide Genesis with the asset attributes required to review and provide the customer with exception management reporting. Genesis has also been working with Westlink to find a solution to tracking of changes and the vesting of new connection into the database.	01/03/2021	

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

Genesis was reconciling this DUML load using the UML profile. They have since updated the Registry to DST. A monthly report is sent each month but was not being used for reconciliation. At the time of the audit the registry information was being used for submission, this has since been updated and they are now using the monthly report that is provided and washups are occurring to correct data.

I compared the submission volumes between the load recorded in the database extract and the registry figure for the month of August 2020. There is a minor difference from the wattage recorded in the database, and the registry figure.

In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 Clause 15.2 and 15.37B(c) From: 21-Jan-20 To: 12-Oct-20	In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates. 23 items of load with the incorrect wattage recorded resulting in an estimated over submission of 7,901.35kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak as the RAMM database was not used for reconciliation for most of the audit period. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Gained asset information, provided database improvement recommendations. Engaged with WBOPDC to provide potential solution to the reporting gap for change management.	Work in progress	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested monthly RAMM data to provide Genesis with the asset attributes required to review and provide the customer with exception management reporting. Genesis has also been working with Westlink to find a solution to tracking of changes and the vesting of new connection into the database.	01/03/2021	

CONCLUSION

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. A RAMM database is managed by Westlink on behalf of WBOP DC in relation to this load. The asset data capture and database population is also conducted by Westlink. The field work is carried out by Horizon.

Genesis was reconciling this DUML load using the UML profile. They have since updated the Registry to DST. A monthly report is sent each month but was not being used for reconciliation. At the time of the audit the registry information was being used for submission, this has since been updated and they are now using the monthly report that is provided and washups are occurring to correct data.

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In absolute terms, total annual consumption is estimated to be 30,200 kWh lower than the DUML database indicates.

The audit found three non-compliances. The future risk rating of 18 indicates that the next audit be completed in six months, however I recommend a 12-month period to reflect the improvement in data provision to Genesis.

PARTICIPANT RESPONSE

Genesis apologies for the lateness of this audit submission, Genesis were working with Westlink to establish better reporting to enable Genesis to attend to the issues outlined in the audits that have been raised multiple times. Genesis has requested that the field attributes reflect the asset information that is being provided to the trader to enable small over allocation issues to be resolved.

Genesis has made some good inroads to finding the right solution and although 5 months has already passed, Genesis would be requesting that the re-audit period be 12 months with the re audit date being 01/12/2021. The fact the audit was late was a failing on Genesis' behalf and should not be a reflection on the customers database.