ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

MATAMATA PIAKO DISTRICT COUNCIL AND MERCURY NZ LTD

Prepared by: Rebecca Elliot

Date audit commenced: 5 March 2018

Date audit report completed: 7 May 2018

Audit report due date: 01-Jun-18

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EXECUTIVE SUMMARY

This audit of the Matamata Piako District Council Unmetered Streetlights (**MPDC**) 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, which became effective on 1 June 2017.

The MPDC DUML volume is reconciled as HHR following the approval by the Electricity Authority of Exemption 233. The installations consist of an approved and certified data logger (to record on and off times) and a database from which the volume is derived.

Power Solutions Limited (PSL) manages the installation, maintenance and database management of all MPDC DUML on their network.

This audit found five non-compliances and makes no recommendations. The future risk rating of eight indicates that the next audit be completed 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 database accuracy is assessed to be 101.8% indicating an estimated under submission of 25,300 kWh per annum. Incorrect profile recorded on the registry for ICP 1000510806PC47F.	Moderate	Medium	4	
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	15 items of load with an unknown light type recorded.	Strong	Low	1	
All load recorded in the database	2.5	11(2A) of Schedule 15.3	One item of load missing from the database	Strong	Low	1	
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 101.8% indicating an estimated over submission of 25,300 kWh per annum. The database is not complete as ballasts are not recorded in the RAMM database.	Moderate	Medium	4	
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 101.8% indicating an estimated under submission of 25,300 kWh per annum. Incorrect profile recorded on the registry for ICP 1000510806PC47F.	Moderate	Medium	4	
Future Risk Rating						14	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Action
		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

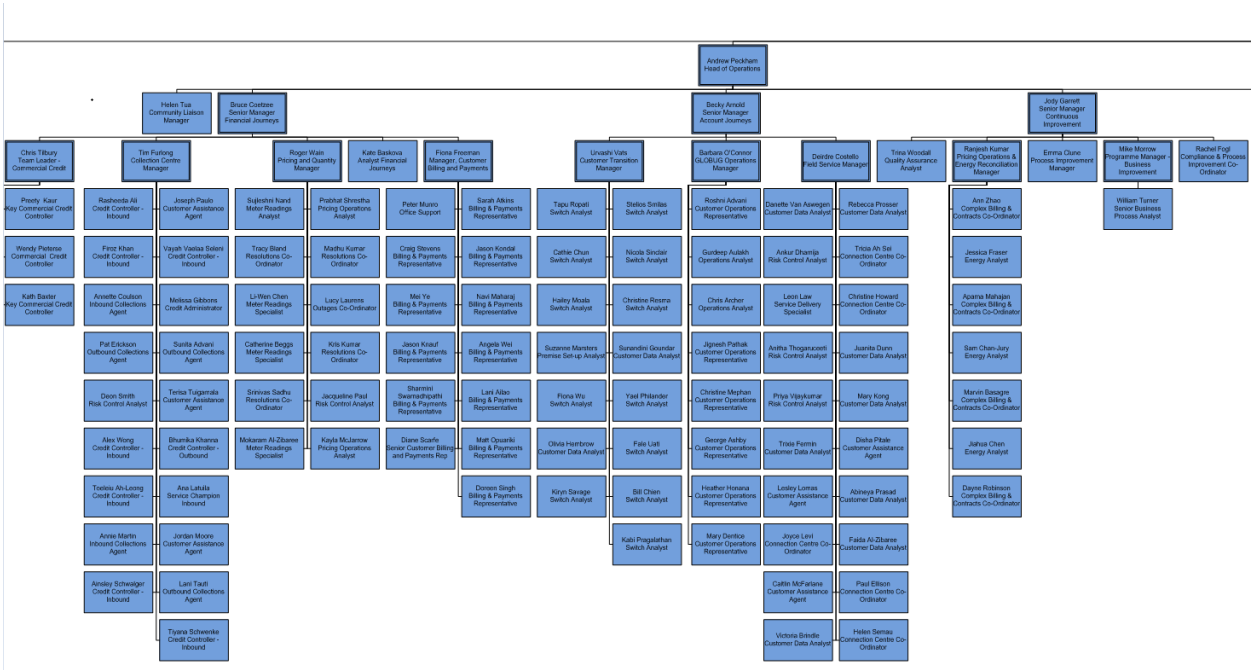
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

Exemption 233 has been granted to allow Mercury to submit HHR data for DUML to the Reconciliation Manager.

1.2. Structure of Organisation

Mercury provided their current organisational structure:



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Andrew Robertson	Regulatory and Compliance Strategist	Mercury Energy
Jon Stevens	Projects Engineer	Power Solutions

1.4. Hardware and Software

Section 1.8 records that Roading Asset and Maintenance Management database, commonly known as RAMM continues to be used the management of DUML. This is remotely hosted by RAMM Software Ltd. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

Power Solutions 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	NSP	Profile	Number of items of load	Database wattage (watts)
1000510806PC47F	Matamata-Piako District Council	WHU0331	HHR	3,423	333,805

1.7. Authorisation Received

All information was provided directly by Mercury or Power Solutions.

1.8. Scope of Audit

This audit of the Matamata Piako District Council Unmetered Streetlights (**MPDC**) 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.

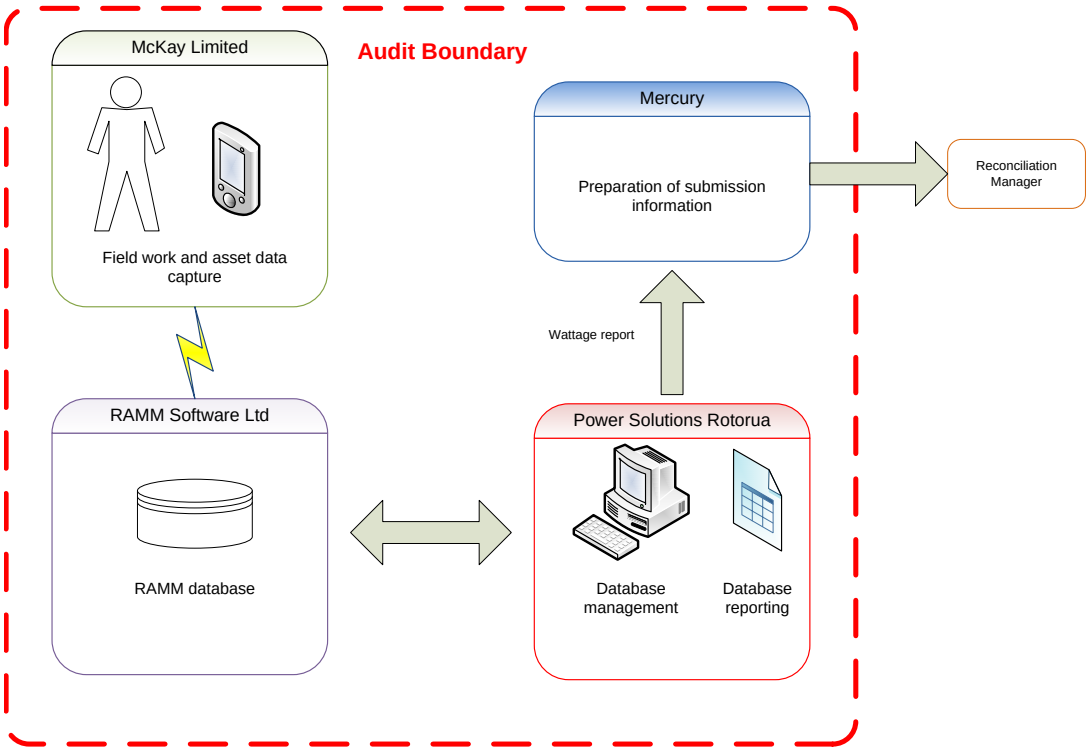
The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

The MPDC DUML volume is reconciled as HHR following the approval by the Electricity Authority of Exemption 233. The installations consist of an approved and certified data logger (to record on and off times) and a database from which the volume is derived.

The database is remotely hosted by RAMM Software Ltd and is managed by PSL, on behalf of MPDC, who is Mercury's customer. McKay Limited is engaged by MPDC and conducts the fieldwork and asset data capture. Reporting is provided to Mercury on a monthly basis by PSL.

The database records all Matamata Piako lights and the NZTA rural lighting for the Matamata Piako area. These items of load are recorded in MPDC RAMM database for clarity of asset ownership, and not for submission. NZTA lighting is outside of the scope of this audit.

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 diagram below shows the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 294 items of load on 5th March 2018.

1.9. Summary of previous audit

Mercury provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in February 2017 this audit report was undertaken for Mercury as part of their 2017 reconciliation participant audit. This audit wasn't submitted due to the audit regime change that occurred on June 1st 2017 . For completeness I have included the findings for reference below:

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Deriving Submission Information	2.1	11(1) of schedule 15.3	Load being submitted using a HHR profile but is recorded on the registry as NHH reconciled.	Still existing
			40 items of load recorded as owned by council with no ICP recorded.	Cleared
ICP Identifier	2.2.1	11(2)(a) of schedule 15.3	ICP not recorded against 40 items of load.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
			Nil	

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

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 within the required timeframe. Compliance is confirmed.

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

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 concerning the methodology for deriving submission information. Mercury reconciles the MPDC load using the HHR profile. The last audit found that ICP 1000510806PC47F had a HHR profile but with the NHH submission flag recorded on the registry. The registry will not allow an update to the trader details until an MEP is registered for a HHR site even though this is a DUML ICP. Mercury are working with the Authority to resolve this issue.

I checked the accuracy of the submission information for the month of December by multiplying the total kW from the database by the total "on" time from the data logger file and the figures matched.

There is some inaccurate data within the database used to calculate submissions. This is detailed in **sections 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: entire audit period	The database accuracy is assessed to be 101.8% indicating an estimated under submission of 25,300kWh per annum. Incorrect profile recorded on the registry for ICP 1000510806PC47F. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. 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
For the incorrect profile issue, this is a known Registry/EA issue and MEEN should not be penalised for it. We have strong control and risk is low/none. MEEN notes that second issue is not material at a market reconciliation level. Mercury is working with the customer to ensure their contractor updates records accurately.	NA and ongoing	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
N/A		

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 had an ICP recorded as required by this clause.

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 the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for each item of load and users in the office and field can view these locations on a mapping system.

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 two fields for wattage, firstly the manufacturers rated wattage and secondly the "ballast wattage". The ballast wattage is expected to be a calculated figure which accounts for any variation from the input wattage and includes losses associated with ballasts. All but 15 items of load had a lamp description, wattage and ballast value applied. The 15 items of load are recorded as "100W Unknown". The light type needs to be determined. This is recorded as non-compliance below.

Power Solutions applies the wattage figure as part of the reporting process to Mercury. The correct wattage and ballasts are applied but this needs to be in the database. This is recorded as non-compliance in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2A) of Schedule 15.3 From: entire audit period	15 items of load with an unknown light type recorded. 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 rated as moderate as all but 15 items of load had the required information recorded. The impact is assessed to be low due to the number of lights involved.

Actions taken to resolve the issue	Completion date	Remedial action status
Mercury is working with the customer to ensure their contractor updates records accurately.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
N/A	N/A	

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 294 items of load on 5th March 2018.

Audit commentary

The field audit findings are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Amenities					
LAWRENCE AVE	2	2			
PUKATEA PL	2	2			
REWI ST	2	2			
New					
ASHWORTH PL	4	4			
CARNOUSTIE PL	4	4			
FAIRWAY DR	9	9			
KAHIKATEA CRES	3	3			
MATIPO ST	12	12			
NIKAU PL	5	5			
RITCHIE ST	17	17			
SUNDALE DR	3	3			
SUNRIDGE PARK RD	1	1			
SUNRISE PL	3	3			
TRALEE PL	3	3			
YOUNG ST_Meadow View	11	11			
Not connected					
DUNLOP RD	1	1			Installed but not yet connected
STATE HIGHWAY 24 (DEC)	5	5			Christmas lights -not connected
WHITAKER ST	4	4			Installed but not yet connected

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
NZTA Rural					
NO.4 RD	1	1			
STATE HIGHWAY 27	43	43			
STATE HIGHWAY 29 (KAIMAI OFF RAMP)	4	4			
NZTA Urban					
STATE HIGHWAY 27	25	25			
TE POI RD	1	1			
TE POI SOUTH RD	1	1			
Parks and Reserves					
CENTENNIAL DR (NORTH)	20	20			
MORRINSVILLE CAMPING GROUND	2	2			
MORRINSVILLE DOMAIN	3	3			
Road lighting					
ASH ST	1	1			
CAMERON RD	2	2			
CLARKE AVE (SOUTH)	4	4			
CYNTHIA CRES	3	3			
ELM ST	2	2			
FIRST AVE (SOUTH)	5	5			
GUMMER PL	3	3			
HEDLEY ST	1	1			
HOLMWOOD PARK DR ROTARY	3	3			
MILLS ST (TE AROHA)	1	1			
STANLEY AVE	53	53			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
VOGEL PL	10	10		3	3x LED found in the field not 70W HPS
VOSPER ST	4	4			
WAIOMOU ST	7	7			
WILSON ST	4	4			
Grand Total	**294**	**295**	**1**	**3**	

I found one additional lamp in the field than was recorded in the database. This is recorded as non-compliance below. The wattage variances found are recorded as non-compliance in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: entire audit period	One item of load missing from the database 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 rated as strong as only one item of load was found to be missing and controls are robust. The impact is assessed to be low, based on the kWh differences described in **section 3.1**.

Actions taken to resolve the issue	Completion date	Remedial action status
Mercury is working with the customer to ensure their contractor updates records accurately.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
N/A	N/A	

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

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On September 20th 2012, the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as the database contained an audit trail. I have interpreted this to mean that the production of a monthly "snapshot" report is sufficient to achieve compliance.

The processes were reviewed for ensuring that changes in the field are notified through to PSL. McKay Electrical enters all field data via "Pocket RAMM" directly into RAMM Contractor. "As built" plans are also provided and PSL then conduct a field check to ensure the database has been populated accurately. The high level of accuracy found in the field audit confirms the process has robust controls.

Monthly "outage patrols" are conducted, and this process is used to check database accuracy.

Festive lights are connected in the Matamata Piako district and these are correctly recorded in the database and included in the submission months that these are connected.

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	Matamata Piako district
Strata	The database contains items of load in Matamata Piako area. The area has three distinct sub groups of urban, rural, NZTA. The processes for the management of MPDC items of load are the same, but I decided to place the items of load into six strata, as follows: 1. Amenities 2. New 3. NZTA Rural 4. NZTA Urban 5. Parks and Reserves 6. Road Lighting
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 42 subunits.
Total items of load	284 items of load were checked.

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

Audit commentary

The field data was 101.8% of the database data for the sample checked. The total wattage recorded in the database for the sample was 31,735 watts. The estimated total wattage found in the field for the sample checked was 32,009 watts, a difference of 274 watts. This will result in estimated under submission of 25,300kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

I checked the wattages and ballasts being applied and found these were added correctly to the monthly report provided to Mercury for submission calculation, but these are not correctly recorded in RAMM and therefore the database is not complete and accurate as required by this clause.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: entire audit period	The database accuracy is assessed to be 101.8% indicating an estimated under submission of 25,300kWh per annum. The database is not complete as ballasts are not recorded in the RAMM database. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. 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
MEEN notes that second issue is not material at a market reconciliation level. Mercury is working with the customer to ensure their contractor updates records accurately.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
N/A	N/A	

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

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

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

Audit observation

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

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

Audit commentary

The last audit found that ICP 1000510806PC47F had a HHR profile but with the NHH submission flag recorded on the registry. This is still the case and is recorded as non-compliance below.

I checked the accuracy of the submission information by multiplying the total kW from the monthly report (derived from the database) by the total "on" time from the data logger file and the figures matched.

The DUML database auditing tool provided a result indicating the field data was 101.8% of the database data. This will result in an estimated under submission by 25,300kWh per annum.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: entire audit period	The database accuracy is assessed to be 101.8% indicating an estimated under submission of 25,300kWh per annum. Incorrect profile recorded on the registry for ICP 1000510806PC47F. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. 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
Duplicate or linked effect of already identified issue MEEN notes that second issue is not material at a market reconciliation level. Mercury is working with the customer to ensure their contractor updates records accurately.	Ongoing	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
N/A	N/A	

CONCLUSION

The MPDC DUML volume is reconciled as HHR following the approval by the Electricity Authority of Exemption 233. The installations consist of an approved and certified data logger (to record on and off times) and a database from which the volume is derived.

Power Solutions Limited (PSL) manages the installation, maintenance and database management of all MPDC DUML on their network.

This audit found five non-compliances and makes no recommendations. The future risk rating of eight indicates that the next audit be completed in 12 months. The matters raised are detailed below:

PARTICIPANT RESPONSE

Mercury remains concerned at the lack of materiality assessment applied to identified breaches. As an example, this report contains one issue reported against 3 obligations. This reduces the audit time significantly and provides no benefit to the market or the customer. Costs are ultimately passed to the consumer.