

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

CHRISTCHURCH INTERNATIONAL AIRPORT
LIMITED
AND CONTACT ENERGY LIMITED

Prepared by: Steve Woods (assisted by Deborah Anderson)

Date audit commenced: 23 April 2018

Date audit report completed: 11 May 2018

Audit report due date: 01-Jun-18

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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 Contact Energy Limited (**Contact**), 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 audit found four non-compliances and makes no recommendations.

The field audit found eight discrepancies in total. I found one lamp type wattage that was incorrect.

The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242 kWh per annum.

Overall, Orion has robust controls and management in place.

The future risk rating of 7 indicates that the next audit be completed in 18 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 used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242 kWh per annum.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	One lamp type has incorrect lamp wattage recorded. <ul style="list-style-type: none"> Eighteen affected lamps, the expected wattage is 77 and under reporting is 153.8 kWh per annum. 	Strong	Low	1	Identified
Database accuracy	3.1	Clause 15.2 and 15.37B(b)	The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242kWh per annum	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions contains some inaccurate information. The database	Moderate	Low	2	Identified

			accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242 kWh per annum.				
Future Risk Rating							7

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	Recommendation

ISSUES

Subject	Section	Description	Issue

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.

There is one exemption in place relevant to the scope of this audit:

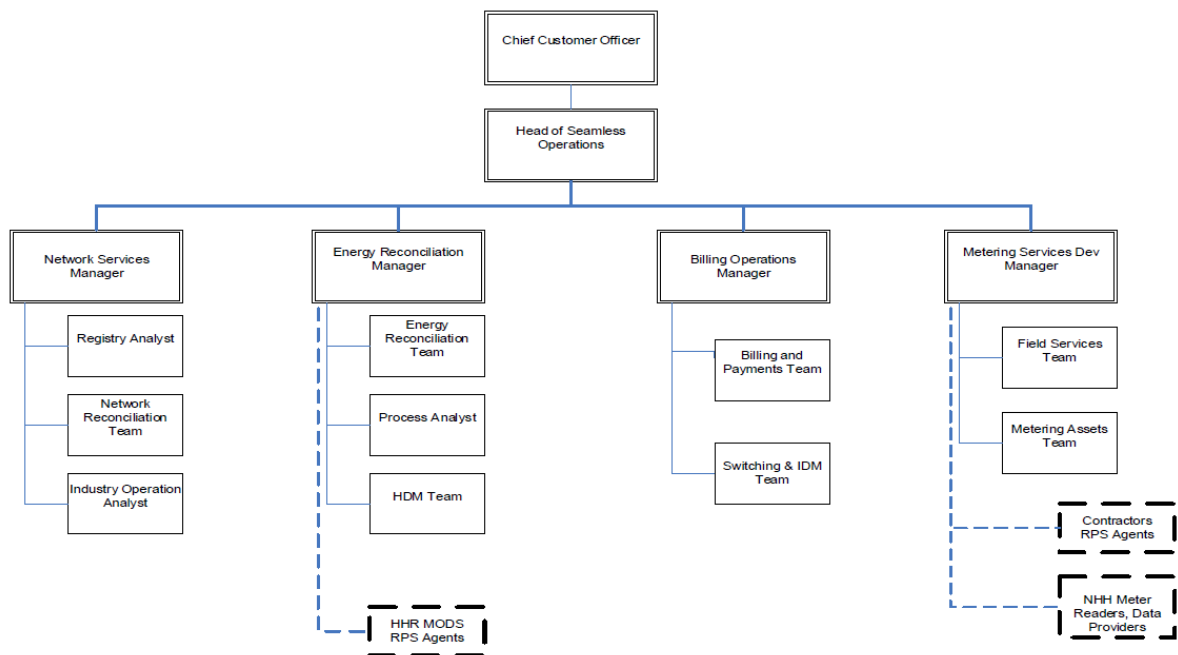
- Exemption No. 177. Exemption to clause 8(g) of schedule 15.3 of the Electricity Industry Participation Code 2010 ("Code") in respect of providing half-hour ("HHR") submission information instead of non-half-hour ("NHH") submission information for distributed unmetred load ("DUML"). This exemption expires at the close of 31 October 2023.

Audit commentary

Compliance is confirmed.

1.2. Structure of Organisation

Contact Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Bernie Cross	Energy Reconciliation Manager	Contact 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.

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	Master ICP CIAL ISL0661	HHR	156	15,956

1.7. Authorisation Received

All information was provided directly by Contact or Orion.

1.8. Scope of Audit

This audit of the CIAL DUMML database and processes was conducted at the request of Contact, 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.

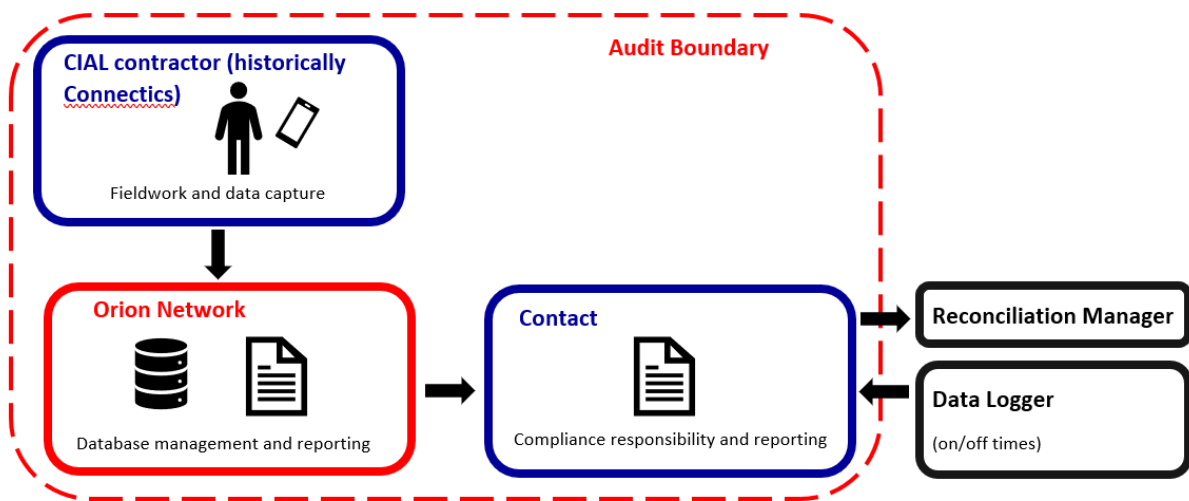
The audit was conducted in accordance with the audit guidelines for DUMML audits version 1.1, which became effective on 1 June 2017.

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 Contact by Orion.

This audit covers the Orion database.

The diagrams below show the audit boundaries for clarity.



The field audit was undertaken of the entire database of 156 items of load on 23rd April 2018.

1.9. Summary of previous audit

Contact provided a copy of the last audit report undertaken by Allie Jones of Contact Energy, completed in March 2017. The table below records the findings.

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Tracking of Load	2.3	Clause 11 (3) of Schedule 15.3	Some Tracking of Load Changes for CIAL not updated in a timely manner	Cleared

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

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

- 1. by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
- 2. within 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

Contact 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. 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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

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

I recalculated the submissions for March 2018 for 0007131634RNDC9 using the data logger and database information. I confirmed that the calculation method was correct. Festive lights were correctly excluded from the calculation because they were not connected.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed further in **sections 2.4** and **3.1**.

I checked the March 2018 extract provided by Orion against the submission totals supplied by Contact and found that submission matched the database.

The methodology for deriving submission information is compliant but non-compliance still exists due to inaccurate information in the database used for submission

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-17 To: 30-Apr-18	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242 kWh per annum. Potential impact: Medium Actual impact: Low Audit history: Once 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
Contact will work with Orion to get the DUML database updated with these correct values and attributes		Sept 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

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 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 Orion database contains fields for the street address and also GPS coordinates. There are 3 records that do not have a Street number but in all cases there is GPS information.

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

Orion's database contains the manufacturers rated wattage and the ballast wattage. The extract provided has a field for 'Lamp Type' and an additional table was provided which contained more detail for each lamp type – description, amps, wattage (incl ballast) & lamp type category.

The Orion database was found to contain one inaccuracy when matched to the published standardised wattage table. The difference found was one lamp type and wattage difference, affecting 18 lamps with an overall wattage difference of 36 W, which equates to 153.8 kW per annum. This is reported as a non-compliance.

Lamp Type	Description	Wattage	Lamp Type Category	Orion database	Correct wattage	Lamps affected	wattage difference	total difference
2*30W FF	2*30W FF	75	Fluorescent	2*30W FF	77	18	2	36W

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 With: Clauses 11(2)(c) and (d) of Schedule 15.3 From: unknown To: 23-Apr-18	One lamp type has incorrect lamp wattage recorded. 18 Lamps affected. The expected wattage is 77 and expected under reporting is 153.8 kWh per annum. 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 because only one lamp type, eighteen of the 156 lamps in the database had incorrect wattage information. The impact is low, the expected wattage for the lamp type is 77.		
Actions taken to resolve the issue		Completion date	Remedial action status
Contact will work with Orion to get the DUML database updated with these correct values and attributes		Sept 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

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 156 items of load on 23rd April 2018.

Audit commentary

The field audit findings for the Orion CIAL database are detailed in the table below:

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Bolt Pl	3	3	-	-	
Deep Freeze Barracks	6	6	-	-	
Deep Freeze Car Park	17	17	-	-	
Ivan Cr	4	4	-	-	
Ivan Jamieson Pl	3	3	-	-	
Memorial Av	2	2	-	-74	2 x 145 W LEDs in place and not the 2 x 182 W LEDs specified
Orchard Rd	34	33	-1	-100	Unable to locate 1 x 100 W HPS
Perimeter Rd	7	7	-	-	
Peter Leeming Dr	20	20	-	-263	3 x 145 W and 1 x 147 W LEDs in place (582 W) and not the 2 x 182 W, 1 x 203 W LEDs or 1 x 250 W HPS specified (845 W)
Richard Pearse Rd	6	6	-	-37	1 x 145 W LED in place and not the 1 x 182 W LED specified
Robin Mann Pl	2	2	-	-	
Ron Guthrey Rd	24	24	-	-37	1 x 145 W LED in place and not the 1 x 182 W LED specified
Syd Bradley Rd	16	16	-	-	
Wairakei Rd	12	12	-	-	
Total	156	155	-1	-511W	

Unable to locate

Relay_Site	SL_Conn_Id	Status	Street	Lamp_Type	East	North
C6/206	SL033820	In Service	Orchard Rd o/s Customs	100W HPS	1563117	5184640

Recommendation	Description	Audited party comment	Remedial action
Clause 11(2)(a) and (aa) of Schedule 15.3	Requested the lamp I was unable to locate was investigated.	From P Lawrence, Orion, 26/4/18 "removal of the additional lamp on Orchard Rd o/s Customs"	Cleared

I found 8 incorrect wattages and one lamp I could not locate in the Orion field audit.

The field data was 96.7% of the database data for the sample checked, and database accuracy is assessed to be 96.7%. The total wattage recorded in the database for the sample was 15,956 watts. The total wattage found in the field for the sample checked was 15,431 watts, a difference of 525 watts. This will result in estimated over submission of 2,242 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

These differences are recorded as non-compliance in **section 3.1**.

This clause requires all items of load in the field to be recorded in the database. There were no examples where items of load were present in the field but were not recorded in the database, therefore compliance is confirmed with this clause.

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

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 subdivisions require a proposed plan to be provided and an "as built" plan once the development is complete. The Council has an acceptance process for new subdivisions. Once installed, the receipt of this information is passed to Orion, for the entire project, and processed within the month that it is received. Orion update the status as at the day of livening.

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.

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

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	Christchurch International Airport Limited
Strata	The database contains 156 items of load for the Christchurch International Airport. The processes for the management of all CIAL items of load is the same. The database has one Class for all lights of 'Street'.
Area units	I completed a field audit of the entire database.
Total items of load	156 items of load were checked.

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

Audit commentary

The Orion database was found to contain one inaccuracy when matched to the published standardised wattage table. The difference found was one lamp type and wattage difference, affecting 18 lamps with an overall wattage difference of 36 W, which equates to 153.8 kW per annum.

Lamp Type	Description	Wattage	Lamp Type Category	Orion database	Correct wattage	Lamps affected	wattage difference	total difference
2*30W FF	2*30W FF	75	Fluorescent	2*30W FF	77	18	2	36

The lamp wattage difference found affected 18 lamps is recorded as a non-compliance in **section 2.4**.

The Orion field audit found 8 incorrect lamp type and wattage differences amounting to 511W and one lamp that could not be located.

The field data was 96.7% of the database data for the sample checked. The total wattage recorded in the database for the sample was 15,956 watts. The total wattage found in the field for the sample checked was 15,431 watts, a difference of 525 watts. This will result in estimated over submission of 2,242 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-17 To: 30-Apr-18	The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242kWh per annum Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time, but there are still some errors. 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
Contact will work with Orion to get the DUMML database updated with these correct values and attributes		Sept 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

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 DUMML is being calculated accurately*
- *profiles for DUMML 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

Contact reconciles this DUMML load using the HHR profile, in accordance with exemption number 177 discussed in **section 1.1**.

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

I recalculated the submissions for March 2018 for Orion ICP 0007131634RNDC9 using the data logger and database information. I confirmed that the calculation method was correct, but the volume information is inaccurate due to some inaccurate records in the database

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: 15.2 and 15.37B(c) From: 01-Apr-17 To: 30-Apr-18	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 96.7% indicating an estimated over submission of 2,242 kWh per annum. Potential impact: Medium Actual impact: Low Audit history: Once 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
Contact will work with Orion to get the DUMML database updated with these correct values and attributes		Sept 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

CONCLUSION

Orion use a purpose-built Oracle system for the management of the DUML information.

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

New connection, fault and maintenance work is managed by CIAL and advised to Orion for timely updating into RAMM.

The field audit was undertaken of the entire database of 156 items of load on 23rd April 2018.

The future risk rating of three indicates that the next audit be completed in 18 months. Four non-compliances were identified, and no recommendations were raised.

PARTICIPANT RESPONSE

APPENDIX A - TEMPLATE FOR NON-COMPLIANCE, ISSUES AND RECOMMENDATIONS.

NON-COMPLIANCE

Non-compliance	Description		
Audit Ref: With: From: Click here to enter a date. To: Click here to enter a date.	Potential impact: Choose an item. Actual impact: Choose an item. Audit history: Controls: Choose an item. Breach risk rating:		
Audit risk rating	Rationale for audit risk rating		
Choose an item.			
Actions taken to resolve the issue		Completion date	Remedial action status
[Participant comment]		[proposed or actual completion date]	Choose an item.
Preventative actions taken to ensure no further issues will occur		Completion date	
[Participant comment]		[proposed or actual completion date]	

RECOMMENDATION

Description	Recommendation	Audited party comment	Remedial action

ISSUE

Description	Issue	Remedial action