



ABN 20 009 454 111

Audit Report
Rottnest Island
2016 Network Quality and Reliability of Supply
Performance Audit -
Operation of Compliance Monitoring Systems

Telephone:
Fax:
E-Mail:
Web:
Postal Address:
Office:

+61 8 9260 0003
+61 8 9225 7447
projects@qualeng.net
www.qualeng.net
PO Box Z5261, St George's Terrace, PERTH WA 6831
Level 2, 231 Adelaide Terrace, Perth, Western Australia, 6000



executive summary

Under the Electricity Industry (Network Quality and Reliability of Supply) Code 2005 (the Code), Division 3, Section 26, Rottneest Island Authority (RIA) is required to arrange for an independent audit of the operation of the systems that are in place to monitor its compliance with Part 2 of the Code or an instrument made under Section 14(3). In July 2016 the RIA commissioned Qualeng to carry out the audit in respect of the operation of the systems to cover the period 1 July 2015 to 30 June 2016.

The RIA's distribution system consists of an 11 kV distribution network (defined as the 11 kV HV Transmission System), both underground and above ground, a number of substations and a 415V LV distribution network comprising five underground feeders. The RIA has contracted Programmed Facility Management (PFM) to manage, operate and maintain the electricity assets and to be responsible for compliance with the licence conditions and with the Code.

The audit was conducted between August and September 2016 and included:

- review of the actions resulting from previous audit recommendations,
- review of supporting documentation,
- interviews of key personnel,
- review of evidence, data, reports and processes demonstrating the operation and performance of the systems.

The audit reviewed the three recommendation and one opportunity for improvement reported in the previous audit and found that all the actions had been completed.

The audit found that the RIA and PFM have maintained adequate systems to monitor compliance with the requirements of Part 2 of the Code. There are processes in place for:

- monitoring the compliance of electricity supply quality through measurement of voltage fluctuations (flicker) and voltage harmonic distortion;
- monitoring of compliance with the requirement to ensure that the supply of electricity

to a customer is maintained and the occurrence and duration of interruptions is kept to a minimum;

- monitoring of interruption duration, frequency and causes of interruption by means of registers for planned and forced outages;
- managing planned and forced interruptions;
- documenting outage procedures, disaster recovery plans, restoration priority and emergency response to maintain supply to customers;
- reduce the effect of interruptions by providing alternative power supplies;
- monitoring the provision of notifications of planned outages to customers and maintaining the duration of interruptions to the prescribed limits, so far as is reasonably practicable;
- monitoring of compliance with the requirement to remedy the causes of significant interruptions or provide alternative arrangements;
- calculation and reporting of reliability data.

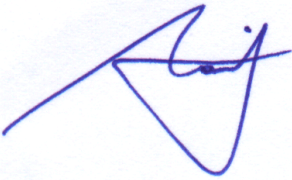
No non-compliances were recorded in this audit. One "Opportunity for Improvement" was recorded:

- The procedure "Independent Power Quality Monitoring and Evaluation" should note that actions arising from the testing of electricity supply quality should be documented in the "Electricity Action Tracker".

Based on the scope of the audit defined in section 26 of the Code Qualeng has found that Rottneast Island Authority has in place systems to monitor its compliance with the requirements of Part 2 of the Code, Quality and Reliability Standards.

This report is an accurate representation of the findings and opinions of the auditors following the assessment of the client's conformance to nominated Licence conditions. The report is reliant on evidence provided by other parties and is subject to limitations due to the nature of the evidence available to the auditor, the sampling process inherent in the audit process, the limitations of internal controls and the need to use judgement in the assessment of evidence. On this basis Qualeng shall not be liable for loss or damage to other parties due to their reliance on the information contained in this report or in its supporting documentation.

Approvals

Representation	Name	Signature	Position	Date
Auditor:	M Zammit		Lead Auditor / Engineering Manager, Qualeng	20/09/2016

Ref		Issue Status		
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A	19/09/2016	First Draft issue	MZ	
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1 Objectives and Scope of Audit

1.1 INTRODUCTION

Rottneest Island Authority (RIA) has an Electricity Integrated Regional Licence (EIRL3) (the Licence) issued by the Economic Regulation Authority (the Authority) under Sections 7 and 15(2) of the Electricity Industry Act 2004 (WA) (the Act). Under the scope of the Licence RIA generates and distributes electricity to commercial customers.

Under the terms of the Act RIA is required to comply with the Electricity Industry (Network Quality and Reliability of Supply) Code 2005 (the Code). In accordance with Division 3 "Performance reporting", Section 26 "Annual report on monitoring systems" of the Code, RIA is required to arrange for an independent audit of the operation of the systems that are in place to monitor its compliance with Part 2 of the Code or an instrument under Section 14(3).

In July 2016 RIA commissioned Qualeng to carry out the Performance Audit to cover the period 1 July 2015 to 30 June 2016. The audit has been conducted and this report prepared in accordance with the Code.

The RIA's distribution system consist of an 11 kV network (identified as the 11 kV HV Transmission System) comprising two feeders (number 2 and number 6), both underground and above ground, a number of substations and a 415V LV distribution network comprising five feeders (Feeders 1, 3, 4, 5 and 7).

The RIA has placed the responsibility for managing the operation and maintenance of the licence assets on Programmed Facility Management (PFM) under a contractual agreement, the Facilities Utilities and Support Services (FUSS). Under this agreement PFM is responsible for compliance with the licence conditions and with the Code.

1.2 AUDIT OBJECTIVES

The purpose of the Performance Audit is to assess and report on the operation of the systems implemented by the licensee to monitor its compliance with Part 2 of the Code or an instrument under section 14(3).

1.3 AUDIT SCOPE

Part 2 of the Code includes 4 Divisions:

1. Division 1, "Quality Standards" for compliance with requirements for quality of supply at the point of connection to the customer, in regard to voltage fluctuations and harmonic distortion.
2. Division 2, "Standards for the interruption of supply to individual customers" provides for the maintenance of supply and management of interruptions to customers, both in terms of the duration and number of interruptions. It includes for:
 - 2.1. Provision of supply with the minimum number and duration of interruptions.
 - 2.2. Consideration of providing alternative supply if the interruption is expected to be significant, its effect substantial on a business or if the customer has special health needs that require continuous supply.
 - 2.3. Allowing planned interruptions if the customer is notified within a suitable time and where the duration does not exceed 6 hours, or 4 hours for temperatures over 30 C or north of the 26th parallel.
 - 2.4. Provides for the distributor to remedy the causes of interruptions or enter into alternative arrangements if the supply has been interrupted more than 12 hours continuously or more than 16 times in the prescribed 12 months and it is considered that the prescribed standard is unlikely to be met for the customer.
3. Division 3, "Standards for the duration of interruptions of supply in particular areas" provides that the average length of interruptions should not exceed 290 minutes in any area of the State, other than the Perth CBD and urban areas and 160 minutes for urban areas other than the Perth CBD (calculated as average of the yearly averages over 4 years).
4. Division 4, "Variations of obligations under this Part" provides for:
 - 4.1. review and approval by the Minister of alternative requirements and
 - 4.2. agreement between the transmitter/distributor and the customer of extensions and modifications to the standards.

The audit was carried out between August and September 2016.

The following representatives participated in the audit on RIA's behalf and/or contributed to sourcing the documentation and providing evidence to the audit:

- Mr Orrin Neale, Island Engineer, PFM
- Mr Dino Ajid, Power Generation Supervisor, PFM.
- Ms Caroline Cussons, Fleet and Administration Officer, RIA.

The main auditor representative was Mr Mike Zammit, Lead Auditor and Mr Shaun Campbell was the documentation reviewer.

1.4 AUDIT METHODOLOGY

The audit followed in part the methodology defined in the Authority's Audit and Review Guidelines: "Electricity and Gas Licences", April 2014, including:

- preparation of an audit plan and risk assessment for Qualeng internal control,
- fieldwork,
- reporting.

The audit proceeded through a documentation review, meetings, interviews and checks of processes. These were supported by additional queries to clarify aspects of policies and procedures.

1.5 LIMITATIONS AND QUALIFICATIONS

An audit provides a reasonable level of assurance on the effectiveness of control procedures, however there are limitations due to the nature of the evidence available to the auditor, the sampling process inherent in checking the evidence, the limitations of internal controls and the need to use judgement in the assessment of evidence.

1.6 ACRONYMS AND ABBREVIATIONS

Abbreviation	Description
Authority	Economic Regulation Authority
CAIDI	Customer Average Interruption Duration Index
CMMS	Computerised Maintenance Management System
Code	Electricity Industry (Network Quality and Reliability of Supply) Code 2005
FUSS	Facilities Utilities and Support Services
NA	Not Applicable
PFM	Programmed Facility Management
Plt	Long Term Flicker (as defined in the Code)
Pst	Short Term Flicker (as defined in the Code)
QoS	Quality of Supply (as defined in the Code)
RIA	Rottneest Island Authority
RMU	Ring Main Unit

Abbreviation	Description
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Frequency Duration Index
THD	Total Harmonic Distortion

2 Licensee's Response to Previous Audit Recommendations

2.1 BACKGROUND

The previous quality and reliability of supply audit was completed in September 2015. This section reviews RIA's progress on the recommendations of the 2015 audit as well as RIA's planned actions to address any outstanding issues.

The recommendations arising from the previous report and the status of the actions determined in this audit have been summarised in the following table.

2.2 PROGRESS OF ACTIONS FROM 2015 AUDIT

The following table lists the recommendations made in the 2015 audit and records progress of any actions.

Item No	Code Ref	Requirement	Findings	2015 Recommendations and Opportunities for Improvement	Status
1	Part 2 Div 1, Sec. 5-7	<p>Quality and Reliability standards, voltage fluctuations, harmonics:</p> <p>A transmitter and a distributor must, so far as is reasonably practicable, ensure that electricity supplied by the transmitter or distributor to a customer's electrical installations, as measured at the point of connection of those installations to the network, at all times complies with the standards including voltage fluctuation (flicker) and harmonics.</p>	<p>▶ Results for fluctuations (flicker) were mainly in accordance with the Code with some excursion in excess of the limit. No evaluation of the electricity supply quality monitoring results was noted. An assessment is required and outcome and actions, if any, documented.</p>	<p>1/2015. Implement a process to ensure that results of electricity supply quality monitoring are reviewed and outcomes and actions documented.</p>	<ul style="list-style-type: none"> • A document has been created, the "Electricity Action Tracker", to document actions arising from audits and drills. <p>The procedure "Independent Power Quality Monitoring and Evaluation" has been created providing detailed instructions for both planned and reactive electricity supply quality monitoring and review.</p> <p>The document "Power Quality Review" lists all the findings of the electricity supply quality monitoring for entry into the "Electricity Action Tracker".</p> <p>Action Closed</p>

Item No	Code Ref	Requirement	Findings	2015 Recommendations and Opportunities for Improvement	Status
2	Part 2 Div 2, Sec 11 (1) (b)	<p>Planned interruptions</p> <p>(1) It is not a breach of section 9 for a transmitter or distributor to interrupt the supply of electricity to a customer for the purpose of maintaining or altering the transmitter's or distributor's network if:</p> <p>(b) the transmitter or distributor has given notice of the proposed interruption to the customer:</p> <p>(i) not less than 72 hours before the start of the interruption;</p>	<p>▶ There were no register or records to indicate that the 72 hour minimum notification had been monitored during the reporting period.</p>	<p>2/2015. There should be evidence to show that compliance with the notification requirement of section 11 of the Code is being monitored.</p>	<ul style="list-style-type: none"> • “Planned Outage Notification Procedure” (2013) requires that notification e-mails be saved on the P-Drive. Audit examined notifications by e-mail which were in compliance with the Code requirements. Records of advance notification are stored in the “Notices Planned” sheet, within the “2015-2016” outage spreadsheet. Figures are cross checked by Powerhouse Supervisor and the Operations Manager. <p>Action Closed</p>
3	Div 2, Sec 12	<p>Significant interruptions to small use customers</p> <p>(2) This section applies at any time when the supply of electricity by a distributor to a small use customer:</p> <p>a) has been interrupted for more than 12 hours continuously; or</p> <p>(b) has in the preceding year been interrupted more than the permitted number of times,</p>	<p>▶ There was no evidence in the current registers that interruptions over 12 hours or that frequency of interruptions in excess of 16 per year are monitored over the 10 year period</p>	<p>3/2015. Establish a process for monitoring compliance of the number and frequency of significant interruptions over 10 years, in accordance with section 12 of the Code.</p>	<ul style="list-style-type: none"> • The outage spreadsheet “2015-2016” records the “Operational” (Forced or Unplanned) and “Planned” Outages and now includes automatic calculations of interruptions duration and frequency over 10 years. <p>Action Closed</p>

Item No	Code Ref	Requirement	Findings	2015 Recommendations and Opportunities for Improvement	Status
4	Div 3, Sec. 13	<p>Standards for the duration of interruption of supply in particular areas System to monitor compliance with standards for the duration of interruption of supply in particular areas (30, 160, 290 min)</p>	<p>▶ At present there is no formal verification of reported information.</p>	<p>4/2015. (OFI) Data entered, calculation results and report figures should be subject to verification. Verification process should be documented; this could be achieved by describing it in the calculation sheets (action carry over from 2012-13 audit). It is noted that a corrective action was in progress at the end of the previous audit period.</p>	<ul style="list-style-type: none"> • The spreadsheet “2015-2016” now includes automatic calculations of interruptions duration and frequency over the period of 10 years. <p>Action Closed</p>

3 Key Findings

3.1 SYSTEM TO MANAGE COMPLIANCE WITH PART 2, DIVISION 1, QUALITY STANDARDS (SEC. 5 TO 8)

Requirement: The Licensee is required to have systems in place to monitor compliance with requirements for quality of supply at the point of connection to the customer, both in terms of voltage fluctuations and harmonic distortion and for disconnection of customer where there is a possibility of damage to the customer installation.

3.1.1 Quality of Supply: System/Process (sections 5 - 7)

Systems are in place for monitoring compliance with the Code quality standards including:

- “Independent Power Quality Monitoring and Evaluation Procedure”;
- “Power Quality Monitoring Review 15 – 16”;
- “Rottnest Island PQ Report 2015-2016”;
- Work management system, the CMMS database (Maximo) produces the Work Orders for the planned measurements of voltage fluctuations and harmonics.

Work Orders were generated to carry out the testing at the time of the year where the network is subjected to peak loads. Test locations were selected by RIA’s Operator, Programmed Facility Management (PFM), which also installed the equipment. An external independent consultant Nilsen WA Pty Ltd provided the equipment, carried out the analysis of the results and prepared the final report.

The testing was carried out at 7 locations between December 2015 and February 2016:

- Abbott St - 16
- Desalination Plant 3
- Geordie Bay
- IGA and Bakery
- Hotel Rottnest
- Shops and Accommodations
- Train1 and 2 (Desalination Plant).

Results of the testing were reported in Nielsen's "Rottnest Island Power Quality Report: Dec. 2015-Jan. 2016".

Individual traces of measurements were included in the report together with the acceptance limits:

- all measurements were in compliance with voltage fluctuation compatibility limits except for single transient one-off spikes of short term flicker;
- there were no continuous instances of spikes in excess of the compatibility limit;
- long term voltage fluctuations were also in compliance with the Code compatibility limits.

Results for the Desalination Plant had been monitored but were outside the scope of the Code as the plant is part of the assets owned by the licensee and is not a customer installation.

Reading of harmonic distortion were reported as Total Harmonic Distortion (THD). All the results for harmonic distortion were below the compatibility limit and in compliance with the requirements of the Code.

Table 1: Flicker and Harmonics Measurements

Site	Flicker (Pst < 1.0; Plt < 0.8)		Harmonics (THD < 8%)	Customer's Complaints on Quality
	Pst	Plt	(Max %)	
Abbott St IGA and Bakery Hotel Rottnest Shops and Accommodations	0.66 to 0.85	0.56 to 0.73	3.7 to 5.5	Nil
Geordie Bay	Peak 1.32 ¹ avg 0.56	peak 0.66 avg 0.57	4.2	

Notes:

1. One single spike over the limit.

3.1.2 Duty to Disconnect if Quality of Supply may Lead to Damage (section 8)

The Operator has procedures for the disconnection of customers where the customer installation may suffer damage due to electricity supply quality.

In addition the operator maintains regular communication with the customers and receives feedback on the performance of the electricity supply. Customer complaints are also recorded.

- Procedure "Independent Power Quality Monitoring and Evaluation Procedure" contains the direction for customer disconnection where the electricity supply quality may cause damage to the customer installation.

Rottneet Island Authority (RIA) has a “Utilities Customer Complaints Procedure” which is published on the RIA web site. A form, the “Utility (Electricity, Water, Gas) Customer Complaint Form” is also available for customers to register their complaints.

No customer complaints related to electricity supply quality were registered during the audit period.

3.1.3 Summary of electricity supply quality issues and reports

There were no instances of recurring voltage fluctuations, harmonic distortion or customer complaints during the audit period and no requirement to disconnect the customer supply.

There was one Opportunity for Improvement :

- ▶ The procedure “Independent Power Quality Monitoring and Evaluation” should note that actions arising from the testing of electricity supply quality should be documented in the "Electricity Action Tracker".

3.2 SYSTEM TO MANAGE COMPLIANCE WITH PART 2, DIVISION 2, STANDARDS FOR INTERRUPTION OF SUPPLY (SEC. 9-12)

The licensee has to have systems to monitor compliance with requirements for the minimisation of interruptions to customers, both in term of the duration and number of interruptions. The requirements are for the licensee to:

- Maintain the supply with the minimum number and duration of interruptions (Sec. 9);
- Reduce the effects of interruptions; consider providing alternative supply if the proposed interruption is expected to be significant, its effect substantial on a business or if the customer has special health needs that require continuous supply (Sec. 10);
- Ensure that where interruptions are planned, where practicable the customer is notified within a suitable time and the duration does not exceed 6 hours, or 4 hours for temperatures over 30 C or north of the 26th parallel (Sec. 11);
- Remedy the causes of interruptions or enter into alternative arrangements if the supply has been interrupted more than 12 hours continuously or more than 16 times in the prescribed 12 months and it is considered that the prescribed standard is unlikely to be met for the customer (Sec. 12).

3.2.1 Duty to maintain the supply with a minimum number and duration of interruptions (Sec. 9)

Requirement: The licensee must establish systems to monitor compliance with the requirement

to ensure, so far as is reasonably practicable, that the supply of electricity to a customer is maintained and the occurrence and duration of any interruptions is kept to a minimum.

The licensee, through PFM, has systems in place monitoring the continuity of supply and the minimisation of the extent of outages. The following documentation is in operation:

- two registers recording outage details such as outage identification, dates, both interruption and restoration times, duration, causes:
 - the “Operational Outages” register, which records forced interruptions;
 - the “Planned Outages” register, which records scheduled interruptions required for maintenance, testing and improvements;
- the "Operational Incident Report Form" which is used to document incident details;
- the work management system, the CMMS database (Maximo) which produces the Work Orders for managing the external review of outages and the fault and repair tasks to minimise the occurrence of outages;
- “PRO-RNI-I03-039-1 System Performance Measures SAIDI SAIFI CAIDI Procedure” for the calculation of reliability figures;
- external review of the operation of the system and outage performance through Nielsen’s “Rottnest Island Power Quality Report: Dec. 2015.-Jan.2016”;
- "Rottnest Island Authority - Electrical Customer Complaints Reporting Register 2015/2016" to identify any customer complaints, in particular, those related to interruptions of the electricity supply.

In order to minimise the impact of interruptions PFM has implemented the following operating processes and plans:

- The SCADA computerised management system operates the power generation system and provides for automatic restoration of power to the distribution system in the event of power failure. If insufficient power is available the powerhouse operator can manually override the SCADA system to restore power in accordance with the order of the Restoration Register.
- the “Generator Restoration Priority Register (LV Board Failure) Electrical Services Procedure” for the provision of mobile electricity generation in the case of a catastrophic failure to the island electrical system;
- the “Electrical Services Disaster Recovery Plan” which outlines the response to any severe interruption, the external companies that can assist in the recovery and any equipment that may be required;
- the “PRO-RNI-I03-041-1 Restoration Priority Register Electrical Services Procedure” for prioritising the restoration of electricity supplies;

Procedures are also in place to bring the equipment back to operation after an outage:

- the “PRO-RNI-I03-035-1 Powerhouse Outages Procedure”.

In the reporting period there were 12 Planned and 4 Operational (forced) outages for the 2015 - 2016 period.

Of the planned outages 7 were for pole maintenance and did not affect any customers. Three were over 6 hours but did not affect any customers.

Of the Operational (Forced) outages:

- one outage on 25 February 2016 was 11 hours was due to a failure of the underground power cable and affected up to 6 customers at Geordie Bay substation. A back-up generator was connected to provide temporary supplies while further mobile generators had to be brought up from the mainland to fully restore supplies to the island. An incident report, “Rottnest Island HV cable Fault”, was prepared in March 2016 detailing the sequence of events and the causes of the interruption.

Summary:

Table 2: Systems to monitor compliance with requirement to maintain supply and the occurrence and duration of interruptions to a minimum

Site	Procedures dealing with outages	Systems and Procedures monitoring performance
All	Yes	Yes

3.2.2 Duty to reduce the effects of interruptions and provision for alternative supplies for proposed interruptions (Sec. 10)

Requirement: The licensee must establish systems to monitor compliance with its duty to reduce, so far as is reasonably practicable, the effect of any interruptions and consider providing alternative supply for proposed interruptions if the interruption is greater than 6 hours, or there is a substantial effect on the business or there are special health needs customers.

Reduce the effect of any interruptions

Discussion with the Operations Engineer, the Powerhouse Supervisor and review of documentation showed that there are procedures in place to monitor and reduce the effect of any interruptions:

- the “Generator Restoration Priority Register (LV Board Failure) Electrical Services Procedure” for the provision of mobile electricity generation in the case of a catastrophic failure to the island LV electrical system;
- the “Electrical Services Disaster Recovery Plan” which outlines the response to any severe

interruption, the external companies that can assist in the recovery and any equipment that may be required;

- the “PRO-RNI-I03-041-1 Restoration Priority Register Electrical Services Procedure” for prioritising the restoration of electricity supplies;
- emergency response tests are documented in the "Electricity Business Continuity Drill Form".
- the “PRO-RNI-I03-035-1 Powerhouse Outages Procedure”, to bring the equipment back to operation after an outage.

The “ Operational Outages” register and the “Planned Outages” registers record forced and scheduled interruptions respectively.

Significant outages are investigated. Reports were examined for two interruptions:

- the “Rottneest Island HV cable Fault” of March 2016 for an outage of 11 hours of 25 February 2016; for this interruptions a back-up generator was connected to restore supplies to part of the network and further mobile generators were brought up to the island overnight to fully restore supplies;
- the “Overhead power pole W7 incident report” of June 2016 records the actions taken to restore supplies following the isolation of a section of the network due to damage to one power pole because of high winds.

The incident reports include review of weaknesses and strengths and identify any opportunities for improvement.

The SCADA computerised management system operates the power generation system and provides for automatic restoration of power to the distribution system in the event of power failure. If insufficient power is available the powerhouse operator can manually override the SCADA system to restore power in accordance with the order of the Restoration Register.

Provision of Alternative Supply

There are documented plans for the use of alternative supplies in the event of significant interruptions:

- the “Generator Restoration Priority Register (LV Board Failure) Electrical Services Procedure” for the provision of mobile electricity generation in the case of a catastrophic failure to the island LV electrical system. The procedures identifies both the restoration priority and the size of generators that will be required to provide back-up power;
- the “Electrical Services Disaster Recovery Plan” which outlines in detail the individual response to severe interruption scenarios, the external companies that can assist in the recovery and any equipment that may be required. The plan defines the steps necessary for restoring power.

There were records of incidents confirming the use of alternative supply.

Special Health Needs Customers and Commercially Sensitive Loads

There were no special health needs (SHN) customers on the island during the audit period.

SHN customers are managed by the RIA. SHN customers have to apply for special support to the RIA, the process is informal and there have been no instances of applications in the last few years. The island has no facilities or resources for supporting SHN customers.

A procedure, “PRO-RNI-I03-034-1 Planned Outage Notification Procedure” is in place, this requires 72 hours advance notification to customers and identification of the need of customers for alternative power generation. Some of the customers on the island, such as Telstra, have their own back up generator sets, however others, like the nursing post and the police rely on PFM for back up supplies.

Summary

Table 3: Systems to monitor compliance with duty to reduce the effect of interruptions and provide alternative supply for planned interruptions

Site	Reduce the Effect of Interruptions	Alternative Supply	Special Needs Customers
All	Yes	Yes	NA (There were no special health needs customers on Rottneest Island in the audit period)

3.2.3 Planned interruptions and Notifications (Sec. 11)

Requirement: The licensee must establish systems to monitor compliance with the requirement to maintain planned outages which do not exceed 6 hours and providing notifications at least 72 hours before each outage for eligible persons (using no more than 50 MW per year).

PFM has a system to manage and monitor planned outages and notifications.

Planned Outages Not Exceeding 4 or 6 Hours

As noted in sections 3.2.1, PFM keeps a register of planned outages, the “Planned Outages” register, which records scheduled interruptions required for maintenance, testing, improvements and a procedure, the “PRO-RNI-I03-034-1 Planned Outage Notification Procedure” setting up the requirements and process of notification.

The procedure “PRO-RNI-I03-039-1 System Performance Measures SAIDI SAIFI CAIDI Procedure” details the requirements for entry of outage data into the Outage registers. Entries of outages, including

planned date and notification date and time in the “Notices Planned” are automatically carried over into the “Planned Outages” register. The procedure also requires verification of dates and details by Powerhouse Supervisor and Island Engineer.

Planned Outage Notifications

A procedure, “PRO-RNI-I03-034-1 Planned Outage Notification Procedure” is in place, this requires notification 72 hours prior to the outage and the storing of records of notification to customers.

Records of communication were examined in the audit. Every planned outage is preceded by communication with all the island customers and the need for alternative power generation is identified.

As noted above, the procedure “PRO-RNI-I03-039-1 System Performance Measures SAIDI SAIFI CAIDI Procedure” details the requirements for entry of outage data into the Outage registers. Entries of outages, including planned date and notification date and time in the “Notices Planned” sheet are automatically carried over into the “Planned Outages” register, allowing the calculation of notice time. The procedure also requires verification of dates and details by the Powerhouse Supervisor and Island Engineer.

Five outages related to emergency generator works did not receive 72 hours advance notification and were highlighted in the registers.

Summary

Table 4: Systems to monitor compliance with planned outages not exceeding 4 or 6 hours and providing notifications at least 72 hours before each planned outage

Site	Duration (≤ 6h)	Systems to monitor notifications ≥ 72 hours prior
All	Yes	Yes

3.2.4 Significant interruptions to small use customers (Sec.12)

Requirement: The licensee must establish systems to monitor compliance with the requirement to remedy the causes of interruptions or make alternative arrangements where significant interruption (duration over 12 hours or more than 16 interruptions in the preceding year) occurred for small use customers and where the Licensee considers that the prescribed standard (9 years out of 10) is unlikely to be met.

As reported at section 3.2.1 outage duration is monitored through the Planned and Operational Outages registers There were no significant interruptions in the audit period. No customer supply was

interrupted more than 16 times in the audit period.

In regard to performance over 10 years, records are available up to 2007 and show that there was only one interruption over 12 hours, in 2011-12 and 16 interruptions within a single audit period occurred only once in the period, in 2006-07.

As this performance is in compliance with the Code, there was no obligation under the Code for the licensee to take any actions under this section.

Summary

Table 4: Systems for monitoring compliance with interruption duration not to exceed 12 hours

Site	2016 # interruptions > 12 hours	9 Years out of 10 (≤ 12 hours)	Causes of Interruption Remedied / Alternative Arrangements
	Compliance = 0	Compliance	
All	0 No small use customer affected	Yes Complying between 2007 and 2016 (only one year interruption > 12 h (2011-12))	No action necessary.

Table 5: Systems for monitoring compliance with interruption frequency not to exceed 16 per customer per period

Site	2016 # interruptions > 16 per period	9 Years out of 10 (# ≤ 16)	2015 # > 16	Causes of Interruption Remedied / Alternative Arrangements
	Compliance = 0	Compliance	Compliance = 0	
All	0	Yes Complying between 2007 and 2016 (only one year > 16 interruptions (2006- 07))	0	No action necessary.

Note: it is noted that the Code and criteria have changed over the 10 year period.

3.3 SYSTEM TO MANAGE COMPLIANCE WITH PART 2, DIVISION 3, STANDARDS FOR THE DURATION OF INTERRUPTION OF SUPPLY IN PARTICULAR AREAS (SEC. 13)

Requirement: The licensee must establish systems to monitor compliance with the Code requirement to ensure that the average length of interruptions to customer premises for the four years up to the current year for areas other than the Perth CBD do not exceed 160 minutes in urban areas and 290 minutes in any other area of the State.

There is a system for monitoring the duration of interruption for compliance with the Code.

The duration of interruptions is calculated in the Planned and Forced Outage registers noted in section 3.2.1 and through the "SAIDI Figures" spreadsheet, which records the data and carries out the annual calculations to report the required performance figures. The spreadsheet carries records of several years so that long term performance can be assessed.

The figure of total length of interruptions per customer premises over a year has dropped to 92.77 minutes in 2015-2016 from a high of 226.4 in 2011-12.

Summary

Table 6: Systems to monitor compliance with requirement for interruption not to exceed 290 minutes average per customer over 4 years.

Site	2016 (< 290 m)	4 Year Average (Avg over 4 years ≤ 290 min)
All	92.77 using distribution connections	38.25 using distribution connections

Note: Definitions of customer numbers and connections were changed in 2011-2012. Calculations are based on 527 connections (which includes accommodation units) whilst previously 191 connections were used.

3.4 PROVISIONS MAY BE EXCLUDED OR MODIFIED BY AGREEMENT WITH CUSTOMERS (SEC 15)

Requirement: A customer and a transmitter or a distributor may agree in writing that a provision of this Part is excluded or modified in relation to the supply of electricity by the transmitter or distributor to the customer and the agreement must set out the matters that the parties consider are the advantages and disadvantages.



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There are no agreements in place to exclude or modify provisions of this Part of the code.

4 Audit Summary and Recommendations

Under Section 26 "Annual report on monitoring systems" of the Code, Rottnest Island Authority is required to arrange for an independent audit of the operation of the systems that are in place to monitor its compliance with Part 2 of the Code. or an instrument under Section 14(3).

The audit has found that monitoring systems are in operation and are in compliance with the requirements of the Code. except as noted in the following summary.

There were three recommendation and one Opportunity for Improvement (OFI) arising from the 2014 - 2015 audit, all findings and recommendations have been closed.

The audit and recommendations summary is provided in the next table. The table summarises the findings and recommendations of the report in regard to the system operation and compliance.

The table rates the various element as complying (✓), not in compliance (✗), or as actions in progress, observations or opportunities for improvement (OFI).

No findings were made in this audit.

One Opportunity for Improvement was noted:

- ▶ The procedure "Independent Power Quality Monitoring and Evaluation" should note that actions arising from the testing of electricity supply quality should be documented in the "Electricity Action Tracker".

Based on the scope of the audit defined in section 26 of the Code, Qualeng has found that the system and processes within RIA and PFM are in compliance with the requirements of Part 2 of the Code, "Quality and Reliability Standards".

Table 7: Systems Compliance Summary

Code Division, Section	Code Requirement	Evidence of System	Evidence of Process	Findings / Comments	Recommended Corrective Actions / Opportunities for Improvement (OFI)
	General System System to monitor compliance with requirements of the Code.			Operation of the systems which monitor Rottneest Island Authority's compliance with the Code, complies with the Code requirements.	
Div 1, Sec. 5 - 7	System to monitor compliance with quality and Reliability standards: voltage fluctuations, harmonics.	✓	✓	Measurements are systematic, initiated from the CMMS work management system and are carried out annually at peak demand time. There were no complaints from customers on quality of supply.	▶ (OFI) The procedure "Independent Power Quality Monitoring and Evaluation" should note that actions arising from the testing of electricity supply quality should be documented in the "Electricity Action Tracker".
				There were one-off spikes in short term fluctuations, however there were no continuous instances of spikes in excess of compatibility limits. Long term flicker was in accordance with Code standards.	
				✓	✓
Div 1, Sec. 8	System to monitor compliance with duty to disconnect if damage may result due to electricity supply quality.	✓	✓	Disconnections are covered by procedures, can proceed in case of emergencies and are documented.	

Code Division, Section	Code Requirement	Evidence of System	Evidence of Process	Findings / Comments	Recommended Corrective Actions / Opportunities for Improvement (OFI)
Div 2, Sec. 9	System to monitor compliance with maintaining the supply with a minimum number and duration of interruptions.	✓	✓	PFM monitors the number of interruptions, their duration, customers affected and causes.	
Div 2, Sec. 10	System to monitor compliance with reduction of effects of interruptions or provision for alternative supplies for proposed interruptions.	✓	✓	Procedures and processes are in place to monitor and reduce the effects of interruptions and provide alternative supplies.	
Div 2, Sec. 11	System to monitor compliance with length and <i>(continued below)</i>	✓	✓	PFM records the length of interruptions. Three planned outage exceeded the duration requirements of the Code.	
	notifications for planned interruptions.	✓	✓	A system is in place to issue notifications of planned interruptions and to maintain and monitor records.	
Div 2, Sec. 12	System to monitor compliance with limiting significant interruptions to small use customers (≤ 16 times or ≤ 12 Hours) and to provide remedial action where breaches occur.	✓	✓	Outage numbers are monitored. There is evidence of compliance in 9 years out of 10. There is evidence of improvement actions.	



Code Division, Section	Code Requirement	Evidence of System	Evidence of Process	Findings / Comments	Recommended Corrective Actions / Opportunities for Improvement (OFI)
Div 3, Sec. 13	System to monitor compliance with standards for the duration of interruption of supply in particular areas (30, 160, 290 min)	✓	✓	Figures are monitored. Complies.	