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*Audit Report*  
Horizon Power  
2009 Network Quality and Reliability of Supply  
Performance Audit -  
Operation of Compliance Monitoring Systems

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## executive summary

Under the Electricity Industry (Network Quality and Reliability of Supply) Code 2005 [the Code], Division 3, Section 26, Horizon Power 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 August 2009 Horizon Power commissioned Qualeng to carry out the audit in respect of the operation of such systems to cover the period 1 July 2008 to 30 June 2009.

The audit was conducted between August and September 2009 and included:

- meetings to review the extent and operation of the monitoring systems,
- review of actions resulting from previous audit recommendations,
- access and review of documentation including reports, policies, plans, procedures, training material and supporting information,
- interviews of key personnel,
- review of evidence, data, reports and processes demonstrating the operation and performance of the systems.

The audit found that Horizon Power has procedures to monitor the quality of supply. Continuous monitoring is provided at the substation busbar whilst monitoring at the customer point of connection is provided in response to customer complaints. Mobile equipment is available to provide this function.

Processes are in place to notify customers of planned interruptions and for service crews to attend to customer faults. Procedures are in place to escalate the response based on the severity of interruptions. Disconnections and connections are performed by service crews as required. Alternative means of supply are in place to mitigate interruptions.

Recording and monitoring of data is in place to check the duration and number of interruptions. Analysis is carried out to assess the significance of the data and causes of faults. Actions are planned and implemented to improve the operation of the systems. The Performance Report 2008-09 provides a summary of the reportable data required by the Code.

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

Actions arising from the previous audit have been completed or are in progress. Implementation of updated procedures for power quality monitoring will need to be reviewed over the next reporting period.

A minor opportunity for improvement was noted in the documentation of the method for monitoring and verifying fault data entry and reporting.



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 review 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**

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**Audit Team**

Audit Team	Description
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S Campbell	Verifier and Technical Reviewer

**Issue Status**

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# 1 Objectives and Scope of Audit

## 1.1 INTRODUCTION

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Horizon Power has an Electricity Integrated Regional Licence (EIRL2 Licence) [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 Horizon Power transmits and distributes electricity to both residential and commercial customers across 28 townships isolated from the South West Interconnected System (SWIS). These extend from the Kimberley in the North to Esperance in the South, 5 remote Aboriginal communities and the North West Interconnected System (NWIS). In addition to their own power generating plant in Carnarvon, Marble Bar, Nullagine, Kununurra and Wyndham, Horizon Power also purchases electricity from third parties.

Under the terms of the Act Horizon Power 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 Horizon Power 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 August 2009 Horizon Power commissioned Qualeng to carry out the Performance Audit to cover the period 1 July 2008 to 30 June 2009.

The audit has been conducted and this report prepared in accordance with the Code and the terms of the services defined in Horizon Power's Specification HP00332.

## 1.2 AUDIT OBJECTIVES

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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

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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, both in terms of 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 term 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 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 is under 6 hours, or under 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 be less than 290 minutes in any area of the State, other than the Perth CBD and urban areas (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 2009. It followed the previous audit completed by Logica in September 2008.

On Horizon Power's behalf various representatives participated in the audit and contributed to sourcing the documentation and providing evidence to the audit.

The main auditor representatives were Mr M Zammit, Project Director and Lead Auditor, Mr S Campbell, Reviewer and Verifier.

## 1.1 AUDIT METHODOLOGY

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The audit followed the methodology defined in the Authority's "Audit Guidelines: Electricity, Gas and Water Licences", July 2009, as applicable. 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 Horizon Power policies and procedures.

## 1.1 LIMITATIONS AND QUALIFICATIONS

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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.

## 2 *Licensee's Response to Previous Audit Recommendations*

### 2.1 BACKGROUND

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The previous quality and reliability of supply audit was completed in September 2008 by Logica. This section reviews Horizon Power's progress on Logica audit recommendations as well as Horizon Power's planned actions to address any outstanding issues.

Recommendation from the previous report were:

1. Implement an internal quality control process to ensure data capture remains adequate for breaches in voltage fluctuations and harmonics
2. Implement a formal communication and training event to educate field based personnel on the work procedure changes for breach in supply quality
3. Improve and document the method for capture and reporting of data for payments made to customers for failure to meet certain standards.

### 2.2 PROGRESS

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#### 2.2.1 Quality control process and training in power quality procedures

Horizon Power has prepared a Power Quality Investigation Handbook, process flows, training material and has prepared reports on the investigations in power quality. The updated process and the training have not been implemented as they are tied to the introduction of TCS (Trouble Call System) due in November/December 2009, which will replace the current TCMS system (Trouble Call Management System). Process-wise quality incidents are tracked through DQM (Distribution Quotation Management System).

#### 2.2.2 Payment procedures

Capture and reporting of data for payments is a requirement under Part 3 of the Code and therefore does not appear to fall under the scope of this audit, however actions were reviewed to provide closure to the previous finding. Procedures are available for handling claims and payments to customers for extended outages (over 12 hours). The process is managed through EOPS (Extended Outage Payment System) which is a Lotus Notes integrated application. Claims made by clients are checked against data recorded on outages in TCMS. Verified claims are then paid.

A separate system and process is used to manage compensation for failure to provide the required notice of planned interruption. Notice is provided by a combination of card drop or by telephone. Only 2 claims were recorded for the 2008-09 period.

### 2.3 FURTHER ACTIONS AND OVERALL ASSESSMENT

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Recommendations on payment procedures have been addressed. Training and new procedures on



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Power Quality Investigation have been documented. These are still to be implemented and will be coordinated by Horizon Power with the introduction of the new TCS system.  
Completion of this action will need to be monitored over the next period.



## 3 Key Findings

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

The Licensee is required to comply with requirements for quality of supply at the point of connection to the customer, both in terms of voltage fluctuations and harmonic distortion and to disconnect the customer where there is a possibility of damage to the customer installation.

#### 3.1.1 System/Process

Procedures are available to manage faults originating from internal monitoring or customer contact. Internal monitoring is provided by measurement at the substation busbar for voltage fluctuations and harmonics. Data is reported and reviewed routinely. Monitoring at customers connections is a reactive process taking place only after a customer complaint is received and receives a preliminary assessment.

Complaints on power quality are initially handled through the fault management system and processed in TCMS (section 3.2.1 of this report has further details on the system). Horizon Power procedures are followed. Once the fault is recorded with the appropriate identification in TCMS it follows a documented response procedure through a "quality" stream. The fault is investigated in the field by the allocated service crew, if the problem is fixed by the crew the action is closed. If the fault is confirmed as a "possible" quality fault then a recommendation may be made to install transportable recorders to measure and monitor the supply quality at the customer connection. The investigation is then continued until resolution and closure.

Horizon Power policies and processes allow the disconnection of customers under a range of conditions, the responsibility to disconnect customers in the event that supply quality may damage the customer installation remains with the service crew.

#### 3.1.2 Evidence and Report

There were no "quality" events recorded during the audit period both for voltage fluctuations and harmonics. It was noted that "quality" events were initially recorded both within and outside the audit period however for most of these events initial identification based on customer reports had been found to be incorrect and the causes of the faults had been revised.

Whilst fault and complaint handling procedures were available and in operation, the procedure covering quality investigation was being updated, a handbook had been prepared but had not been approved or registered in the document control system (DMS). Training material had also been prepared to support the implementation of the procedure, delivery of the training was on hold pending further progress in the new trouble call management system (TCS) due for completion in November/December 2009.

There was evidence to demonstrate that the investigation process was in operation.

## 3.2 SYSTEM TO MANAGE COMPLIANCE WITH PART 2, DIVISION 2, STANDARDS FOR INTERRUPTION OF SUPPLY

The Licensee has to comply with requirements for the management 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.
- Reduce the effects of interruptions; provide alternative supply if the proposed interruption is expected to be significant, its effect substantial or if the customer has special health needs that require continuous supply.
- Ensure that where interruptions are planned, where practicable the customer is notified within a suitable time and the duration is kept under 6 hours, or under 4 hours for temperatures over 30 C or north of the 26th parallel.
- 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.

### 3.2.1 Maintain the supply with a minimum number and duration of interruptions (Sec. 9)

Procedures are in place for handling faults and responses to faults, including:

- managing the initial fault,
- acknowledgement and recording,
- management of response,
- allocation of tasks,
- fault resolution,
- reporting and closure of action.

Fault or outages are reported to the Customer Call Centre, this service has been provided by Western Power since May 2009 on 24 hours / 7 day basis. Previously this service was provided by Synergy. Horizon Power procedures are followed. The fault is recorded in TCMS and follows a documented response procedure.

Fault data is cross checked through a verification process to confirm fault duration and entry of outage data into the system. This is performed on spreadsheet based reports provided by the RDV (Reliability Data Validator) application through a manual checking process to confirm fault duration and entry of outage data into the system. There may be an opportunity for improvement in documenting the checking process.

A crisis management procedure escalates the response to emergencies where consequences of the faults increase in severity. A Recognition, Notification and Activation Matrix is available to analyse the risk and consequences and provide the appropriate response. Emergency Response Teams, Emergency Management Teams or Crisis Management Team are activated depending on the level of response required.

Data reports and event records were viewed and demonstrated the application of the procedures and the operation of the system.

### **3.2.2 Reduction of effects of interruptions or provision for alternative supplies for proposed interruptions (Sec. 10)**

The crisis management procedure is available to provide the appropriate response depending on the fault severity.

Mobile equipment is available throughout the network and can be deployed by the Regions to provide alternative supplies where necessary.

A life support register is maintained to identify customers that require electricity for health reasons. The system relies on the customer notifying Horizon Power through a form. Once the customer is registered, notification is sent to the regions and the account is "flagged".

### **3.2.3 Planned interruptions (Sec. 11)**

Planned interruptions are managed through TCMS. Three days notice are provided for planned interruptions through a Planned Interruption Card or telephone notice. There was evidence to show that the system was in operation and results were monitored.

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

For significant interruption (duration over 12 hours or more than 16 interruptions in the preceding year) where the Licensee considers that the standard is unlikely to be met the Licensee is required to remedy the causes of interruptions or make alternative arrangements.

Horizon Power reports the results in its yearly Performance Report for Network Quality and Reliability of Supply. The 2008/09 Performance Report [Report] lists both the interruptions exceeding the duration and recurrence requirements. An analysis is carried out for interruptions over 12 hours duration and identifies the causes of interruptions. Significant events are also checked so that records which are due to "Major Events" (cyclones, widespread flooding) are separated from daily results and the different events analysed separately.

Data and records for the prescribed year were viewed during the audit.

Records for the number of interruptions were also available and reported in the Performance Report 2008-09. No analysis was included in the Report for this criterion however results were reviewed at District level. Of significance was the "Average Number of Interruptions for Customer Premises" for Wyndham which was 21.88 for 2008-09 (compared to Code requirement of 16), this following a figure of 29.95 in the preceding period. Analysis at District level showed contributing factors were planned outages and loss of incoming supply, which confirmed that the system was not subject to local faults. Projects and actions had been identified and started by Horizon Power to improve the overall reliability.

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

The Code provides that the average length of interruptions be less than 290 minutes in any area of the State, other than the Perth CBD and urban areas.

Horizon Power reported these figures in its 2008-09 Performance Report. Analysis of this data was performed at the Districts.

## 4 *Audit Summary and Recommendations*

### 4.1 SUMMARY

Under Section 26 "Annual report on monitoring systems" of the Code, Horizon Power 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 satisfy the requirements of the Code.

Actions resulting from the previous audit have either been completed or are in progress. One opportunity for improvement has been identified and is noted in the recommendations,

The table below summarises the findings of the report in terms of Horizon Power's system operation, evidence and response/corrective actions to address non compliance.

The table rates the various element as satisfactory (✓) , as observations or in progress or in need of improvement (Note) or unsatisfactory (✗).

**Table 1: Systems Compliance**

Code Division, Section	Code Requirement	System / Process	Evidence Findings / Observations.	Corrective Actions Where Non-compliance to Code <sup>a</sup>	Comments / Recommended Corrective Actions
Div 1, Sec. 5 - 7	Quality and Reliability standards: voltage fluctuations, harmonics	Note 1	✓	✓	1 - Measuring system is reactive, providing measurement at the customer connection only once a complaint is received.
Div 1, Sec. 8	Duty to disconnect if damage may result	Note 2	✓	✓	2 - Responsibility to disconnect customers remains with the service crew.
Div 2, Sec. 9	Maintain the supply with a minimum number and duration of interruptions	Note 3	✓	✓	3 - Manual checking process (from RDV and spreadsheet report) to confirm fault duration and entry of outage data into system.
Div 2, Sec. 10	Reduction of effects of interruptions or provision for alternative supplies for proposed interruptions	✓	✓	✓	
Div 2, Sec. 11	Planned interruptions	✓	✓	✓	
Div 2, Sec. 12	Significant interruptions to small use customers (> 16 times or > 12 Hours)	✓	✓	✓	
Div 3, Sec. 13	Standards for the duration of interruption of supply in particular areas	✓	✓	✓	

<sup>a</sup> Existence of corrective actions by Horizon Power where non-compliance to the Code has been encountered.

## 4.2 RECOMMENDATIONS

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The following recommendations are made:

1. Training and new procedures on Power Quality Investigation have been documented. However these are still to be implemented and are due to be coordinated by Horizon Power with the introduction of the new TCS system due November/December 2009. Completion of this action will need to be monitored over the next period.
2. There is an opportunity for improvement of the documentation for the method of monitoring and verifying fault data entry and reporting. Currently this is performed on spreadsheet based reports provided by the RDV (Reliability Data Validator) application through a manual checking process to confirm fault duration and entry of outage data into the system.

*Appendix A*  
*Acronyms and terms*

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## **Appendix A: Acronyms and terms**

Due to the large amount of documentation accessed during the audit, only the main documents are referred in this list. Other documentation is individually referred to in the audit and review tables and report.

<b>Abbreviation</b>	<b>Reference Documents</b>
DMS	Document Management System
DQM	Distribution Quotation Management System
EOPS	Extended Outage Payment System
NWIS	North West Interconnected System
RDV	Reliability Data Validator
SWIS	South West Interconnected System
TCMS	Trouble Call Management System
TCS	Trouble Call System