





**LORD HOWE ISLAND**

**ELECTRICITY NETWORK SAFETY MANAGEMENT SYSTEM**

**ANNUAL PERFORMANCE REPORT FOR 2017/18**



**August 2018**

Date	Name	Signed Approval
31 Aug 2018	Peter Adams, CEO, Lord Howe Island Board	
10 Aug 2018	John Teague, Manager Infrastructure & Engineering Services, Lord Howe Island Board	

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## Introduction

As the Electricity Network Operator (ENO) for Lord Howe Island, the Lord Howe Island Board (the Board) is required to have an Electricity Network Safety Management System (ENSMS).

The Board has completed the preparation of the LHIB ENSMS including the initial independent audit of the system and is waiting to receive any final feedback from IPART. The document is available on the Boards web page.

As requested by IPART, this document presents the interim Annual Performance Report for the Lord Howe Island electricity network, while the ENSMS is finalised.

This report is based on Appendix A of IPART’s Electricity Networks Reporting Manual – April 2018.

### 1. Safety and reliability of the network operator’s network

#### 1.1. Programs and activities undertaken to maintain or improve the safety and reliability of the network operator’s network

Outside of business-as-usual arrangements, the Board has not undertaken any one-off activities to promote the safety and reliability of the network due to completing the final development of the LHIB ENSMS.

Following the development of the ENSMS and completion of the initial external audit the following non compliance actions were completed.

**Table 1 : Non-compliances relating to the safety and reliability of the electricity network**

Identified non-compliances	Actions against non-compliances	Progress of Actions	Completion Date
Formal Safety Assessments to be completed	Complete Formal Safety Assessments	Completed	25 May 2018
Stakeholder identification and engagement in the Formal Safety Assessments to be performed	Develop and undertake Stakeholder group using EMS and Board Members	Completed	8 March 2018
Risk assessment methodology / framework to be developed to support the risk assessment process and maintain consistency in the analysis of risks. Rationale for the selection of likelihood to be documented.	Develop/document risk assessment methodology for implementation with FSA’s	Completed	25 May 2018
Completeness check to be performed, based on the network’s particular operational zones / locations.	Consider implications and take necessary actions and update documents.	Completed	25 May 2018
Completeness check to be performed, based on the network’s functional units.	Consider implications and take necessary actions and update documents.	Completed	25 May 2018

Identified non-compliances	Actions against non-compliances	Progress of Actions	Completion Date
Specific procedures be developed to implement the control measures including: 1) The development of a standard switching procedure for each substation that also incorporates the permit to work 2) Updating the substation maintenance sheets to include a reference to the most recent version of the manufacture / supplier's maintenance manual. A note on each of the maintenance steps when reference should be made to the manufacturer's manual should also be included	Continue with development of required documents	Complete	26 March 2018
The FSA is required to be completed. Following completion, the ENSMS and FSA need to be brought to the attention and made readily accessible to the persons involved in its implementation.	Complete Formal Safety Assessments (FSA) Undertake induction and training for staff and electrical personnel in the ENSMS Bring to the attention and made readily accessible to the persons involved in its implementation	Complete  Commenced – On going  New Employee Induction	25 May 2018  26 March 2018  25 May 2018
Stakeholder engagement and consultation in the ENSMS. Publish the ENSMS on the LHIB website.	ID stakeholders, update documents, conduct consultation and publish on website any further documents considered necessary to publicise.	Complete	5 February 2018

## 2. Advice to the public about hazards associated with electricity in relation to the network operator's network

### 2.1. Programs and activities undertaken to promote the public knowledge and understanding of electrical network safety hazards

No outside of business-as-usual arrangements, has been undertaken to promote the safety and reliability of the network over the past 12 months as updating and presenting the ENSMS has taken priority with our limited resources.

### 2.2. Management of bushfire risk relating to electricity lines and other assets of the network operator's network that are capable of initiating bush fire

#### 2.2.1. Programs and activities undertaken to maintain or improve the management of bushfire risk associated with the network operator's network

The Board has previously advised that due to the sub-tropical climate, the bushfire risk on the Island is quite low. In addition, the network powerlines are all underground, with only substations above-ground. For these reasons, there are no items to report in this section.

**Table 2 : Non-compliances relating to the management of bushfire risk associated with the electricity network**

Identified non-compliances	Actions against non-compliances	Progress of Actions	Completion Date
Nil to report			

### 2.3. Bushfire risk management report

See attached LHIB ENSMS - Bushfire Risk Management Report - 2016-17.

## 3. Contextual Information

### 3.1. Deviation from standards

Nil to report.

**Table 3 : Deviations from standards**

Deviation description	Justification
Nil to report	

### 3.2. Significant community infrastructure

For the purposes of incident reporting over the previous financial year, the Board considered the following to be significant community infrastructure:

- Gower Wilson Memorial Hospital
- Airservices Australia aviation navigation equipment
- Airport terminal

## 4. Formal safety assessment reviews and residual risks

As part of the development of ENSMS, the Board has prepared a risk register, so there is nil to report as part of this document.

## 4.1. Classification of risk levels

LHIB Health & Safety Risk Matrix					
CONSEQUENCE	Insignificant	Minor	Moderate	Major	Catastrophic
<b>PROBABILITY</b>	May have little or no impact on health and safety	May have some impact on health and safety, but will be able to recover from or repair the damage within a relatively short term	A moderate permanent disability or long term impairment	A single fatality or severe permanent disability	Multiple fatalities or significant irreversible effects on the health of a large number of people
<b>Likely</b> There is a very good chance this event will occur in the near future	L	M	H	E	E
<b>Probable</b> This event has occurred several times or more in corporate experience	L	M	H	E	E
<b>Possible</b> This event might occur once or twice in corporate experience	L	L	M	H	E
<b>Unlikely</b> This event does occur somewhere from time to time, but very seldom	L	L	M	M	H
<b>Rare</b> It is theoretically possible for this event to occur, but extremely unlikely that it will	L	L	M	M	M
<p><i>Key: L = Low manage by routine procedures      M = Medium; management responsibility must be specified      H = High; senior management attention needed      E = Extreme; immediate action required</i></p>					

### 4.3. Risks within the scope of ENSMS

No.	Risk Descriptor	Hazard	Risk Category	Consequence Description	Consequence Rating	Likelihood Rating	Inherent Risk	Hierarchy of Controls	Controls	Residual Risk	ALARP
1	Digging up underground mains	Electricity	Operational Design	Possible electric shock or electrocution from excavation works  Damage to network equipment	Major	Probable	Extreme	Administrative	<ul style="list-style-type: none"> <li>Dial before you dig</li> <li>Protection of HV cables at Power House and Backup Generator</li> <li>LV circuits protected from distribution substations</li> <li>ENSMS Public Electrical Safety Plan</li> <li>Electrical safety awareness programs</li> </ul>	Medium	Yes
2	Street light bollard, LV pillar or substation hit/damaged by vehicle	Electricity	Design Operational Maintenance	Possible electric shock or electrocution from live wires	Major	Probable	Extreme	Administrative Engineering	<ul style="list-style-type: none"> <li>Siting bollards, pillars or substations where they are unlikely to be run over</li> <li>HV protection at Power House or Standby Generator</li> <li>LV circuit breakers at substations protect all outgoing circuits</li> <li>Safety switches to be used to protect street lights in the future.</li> <li>Visual check for trees likely fall as part of 6 monthly checks</li> <li>ENSMS Public Electrical Safety &amp; Maintenance Plans</li> </ul>	Medium	Yes
3	Restoration of supply after blackout where a vehicle has	Electricity	Operational	Possible electric shock or electrocution when	Catastrophic	Possible	Extreme	Administrative	<ul style="list-style-type: none"> <li>Patrol of assets to occur for all unplanned outages before restoration</li> <li>ENSMS Operational Plan</li> </ul>	Medium	Yes

No.	Risk Descriptor	Hazard	Risk Category	Consequence Description	Consequence Rating	Likelihood Rating	Inherent Risk	Hierarchy of Controls	Controls	Residual Risk	ALARP
	hit/damaged a pillar or transformer			electricity is restored							
4	Transformer or HV distribution pillar fault causing an explosion	Flying objects	Design Maintenance	Possible blunt injury or death flying debris	Major	Possible	High	Administrative	<ul style="list-style-type: none"> <li>Protection provided at Power House and Backup Generator</li> <li>Transformers fully contained</li> <li>No exposed porcelain insulators</li> </ul>	Medium	Yes
5	Shocks from taps in showers & the like in homes caused by the network	Electricity	Design Maintenance	Possible electric shock or electrocution from live tap caused by a faulty or poor neutral connection on the network	Moderate	Unlikely	Medium	Administrative	<ul style="list-style-type: none"> <li>Yearly substation and pillar maintenance checks for corrosion or burning of neutral connections.</li> <li>The MEN system helps minimise the risk.</li> <li>ENSMS Electrical safety awareness plan options.</li> </ul>	Medium	Yes
6	Unauthorised persons accessing and/or operating network equipment.	Electricity	Design Maintenance Operational	Unauthorised persons may receive burns from arcs or receive an electric shock or be electrocuted	Major	Probable	High	Administrative Engineering	<ul style="list-style-type: none"> <li>Equipment generally inaccessible due to locks</li> <li>No exposed equipment in compounds such as zone substations or poles</li> </ul>	Medium	Yes
7	Vandalism of network equipment	Electricity Explosion Arc flash	Design	Potential electric shock, electrocution, burns or blunt force trauma to members of public	Major	Possible	High	Administrative	<ul style="list-style-type: none"> <li>ENSMS Electrical safety awareness programs.</li> <li>ENSMS Emergency plans</li> <li>Network protection equipment particularly for street lights</li> </ul>	Medium	Yes



No.	Risk Descriptor	Hazard	Risk Category	Consequence Description	Consequence Rating	Likelihood Rating	Inherent Risk	Hierarchy of Controls	Controls	Residual Risk	ALARP
									<ul style="list-style-type: none"> <li>• Danger signs</li> </ul>		
8	Copper theft	Electricity Arc flash	Design	Copper is used for HV and LV cabling and for earthing. Other networks have experienced copper theft.	Major	Possible	High	Administrative	<ul style="list-style-type: none"> <li>• ENSMS Electrical safety awareness programs.</li> <li>• ENSMS Emergency plans</li> <li>• Network protection equipment particularly for street lights</li> <li>• Aluminium used for some cables</li> <li>• Danger signs</li> <li>• Small island and difficulties in obtaining without witness and difficulties with the sale of copper</li> </ul>	Medium	Yes
9	Emergency service personnel working near or touching “live” apparatus while putting out fire	Electricity	Design Operational Maintenance	Emergency service personnel may receive a shock or be electrocuted	Major	Unlikely	Medium	Administrative	<ul style="list-style-type: none"> <li>• Discussion/training session with emergency personnel</li> <li>• Emergency personnel trained to follow guidance of ENA DOC 008 as stipulated in ENSMS Public Electrical Safety and Emergency Plan</li> </ul>	Medium	Yes
10	Faulty wiring or equipment within an electrical installation whether by an electrician or home owner	Electricity Fire	Public safety	Potential electric shock or electrocution to member of public or loss of property	Catastrophic	Possible	High	Administrative	<ul style="list-style-type: none"> <li>• ENSMS Customer Electrical Installation Safety Plan</li> <li>• Switchboard upgrade, product safety recalls, DIY and General Electrical Safety advice in Public Electrical Safety Plan</li> <li>• ENSMS Electrical Safety Awareness Plan and program of activities</li> </ul>	Medium	Yes

No.	Risk Descriptor	Hazard	Risk Category	Consequence Description	Consequence Rating	Likelihood Rating	Inherent Risk	Hierarchy of Controls	Controls	Residual Risk	ALARP
11	Lightning entry into homes via network	Electricity Arc flash	Design	Potential damage to network and customer equipment as well as electric shock to member of public	Major	Possible	High	Engineering Administrative	<ul style="list-style-type: none"> <li>An underground network and Multiple Earth Neutral (MEN) system limits risk</li> <li>Lightning advice in ENSMS Public Electrical Safety Plan</li> </ul>	Medium	Yes
12	High seas, storm water, lightning, tsunamis, fire	Electricity	Operational	Potential damage to property, loss of supply and electric shock or electrocution of staff/contractor or member of public	Catastrophic	Unlikely	High	Engineering Administrative	<ul style="list-style-type: none"> <li>ENSMS Emergency plan</li> <li>Underground network</li> <li>Electrical safety rules</li> </ul>	Medium	Yes
13	Erosion at base of substation	Electricity Arc flash	Public safety	Erosion could cause damage to the substation causing arc flash or electric shock	Catastrophic	Unlikely	High	Engineering Administrative	<ul style="list-style-type: none"> <li>Regular checks as part of maintenance and monthly checks</li> <li>Corrective actions if erosion was to occur</li> <li>Site assessment for new substations and appropriate design</li> </ul>	Medium	Yes

#### 4.4. Reviews of formal safety assessments

In the development of the ENSMS the full suite of formal safety assessments (FSA) has been developed in the past 12 months and consequently no reviews are required.

### 5. Safety risk management actions

There are no open safety risk management actions to report on.

**Table 4 : Risk management actions – open, completed and raised**

Criteria	Number
Number of risk management actions within the ENSMS scope the were raised within the year	0
Number of open safety risk management actions within the ENSMS scope from any reporting year	0
Percentage of safety risk management actions within the ENSMS scope completed by the due date within the reporting year	0%

### 6. Compliance with directions

No directions under Clause 13 of the Electricity Supply (Safety and Network Management) Regulation 2014 have been issued by IPAR to the Board during the last financial year.

**Table 5 : Data on directions issued by IPART**

Total number of directions issued by IPART	Total number of directions outstanding	Number of outstanding directions not complied with by the due date
0	0	0

### 7. Outstanding directions not complied with

Nil outstanding directions

### 8. Statistical reporting

#### Network asset failures

**Table 6: Network asset failures**

Asset Type	Asset population or length	Target functional failure rate	Conditional failures past due in the reporting year	Functional Failures			
				Unassisted		Assisted	
				No fire	Fire	No fire	Fire
Pole/tower Pole top structures/ components	-						
Conductor- transmission/sub- transmission	-						

Asset Type	Asset population or length	Target functional failure rate	Conditional failures past due in the reporting year	Functional Failures			
				Unassisted		Assisted	
				No fire	Fire	No fire	Fire
Conductor - High Voltage	13 km	0	-	0	0	0	0
Conductor – low voltage	10 km	0	-	0	0	0	0
Service wire	-						
Primary plant – power transformers	-						
Primary plant – distribution transformers	13	0	-	0	0	0	0
Primary plant – reactive plant	-						
Primary plant – switchgear	13	0	-	0	0	0	0
Secondary plant – protection equipment	13	HV fuses – 0	-	0	0	0	0
Secondary plant – SCADA	1	0	-	0	0	0	0
Secondary plant – substation batteries	-						

## 9. Encroachment on network assets

**Table 7: Vegetation**

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	0	0
Category 2 defects overdue	0	0
Category 3 & 4 defects overdue	0	0
Total vegetation encroachments as a result of third parties	0	0

**Table 8: Ground Clearance**

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Number of OH spans for which inspections were planned	n/a	n/a
Number of OH spans for which inspections became overdue	n/a	n/a
Number of OH spans for which LIDAR inspections became overdue	n/a	n/a
Number of defects identified	n/a	n/a
Number of defects rectifications that became overdue	n/a	n/a
Total ground clearance encroachments as a result of third parties	n/a	n/a

**Table 9: Clearance to structures**

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Category 1 defects	0	0
Category 2 defects overdue	0	0
Category 3 & 4 defects overdue	0	0
Total structures encroachments as a result of third parties	0	0

## 10. Unauthorised access to the network

**Table 10: Unauthorised access to the network**

Criteria	Network Operator	Accredited Service Providers	General Public
Major substations and switching stations	0	0	0
Distribution substation, regulators, switches and associated equipment	0	0	0
Electricity mains outside major substations	0	0	0
Communications equipment outside major substations	0	0	0

## 11. Customer safety reporting

**Table 11: Customer safety reporting**

Criteria	Number
Number of disconnections of customers premises arising from safety concerns	0
Number of customer shocks from installations	0
Number of customer shocks from installations caused by the ENO's electricity network	0

## 12. ENO Comments

### Safety of electrical installations of customers

Programs and activities undertaken to maintain or improve the safety of electrical installations of customers

Outside of business-as-usual arrangements, the Board has undertaken the following one-off activities to promote the safety of electrical installations of customers:

- 1) Ongoing Program - As there are no full time licensed electrical contractors on the Island, the Board's Senior Electrical Officer (SEO) provides a quick response service for safety issues not related to the Board's network, so that the issue can be made safe until a licensed electrical contractor can carry out the full repair.





## LORD HOWE ISLAND

### ELECTRICITY NETWORK SAFETY MANAGEMENT SYSTEM

### BUSHFIRE RISK MANAGEMENT REPORT FOR 1 OCTOBER 2016 TO 30 SEPTEMBER 2017



Date	Name	Signed Approval
31 Oct 2017	Penny Holloway, CEO, Lord Howe Island Board	
31 Oct 2017	John Teague, Manager Infrastructure & Engineering Services, Lord Howe Island Board	

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## Introduction

As the Electricity Network Operator (ENO) for Lord Howe Island, the Lord Howe Island Board (the Board) is required to report on Bushfire Risk Management related to the electricity network.

The report covers the period from 1 October 2016 to 30 September 2017.

This report is based on Section 4 and Annexure 2 of IPART's Electricity Networks Reporting Manual – November 2016.

## Bushfire Risk Management Background for Lord Howe Island

The bushfire risk on Lord Howe Island is assessed as low due to the island being sub-tropical in nature, relatively high rainfall and the lush vegetation that prevails.

The whole electrical network on the Island is installed underground and all future network extensions are to be installed underground. The high voltage network is also protected at the Powerhouse and standby generator by high voltage fuses. The Board will comply with our design, construction, commissioning, maintenance, operations and decommissioning plans to assist with bushfire prevention.

The propensity to start a bushfire in such circumstances is extremely low.

## Climate Conditions

Over the last 12 months, annual rainfall has been 1,530mm, just above the long term average of 1,508mm. Average 3pm temperatures of 21.1<sup>0</sup> C have been just below the long term average of 22.2<sup>0</sup> C. Compared to recent past, it has been a relatively wet year, dryer than normal winter and a wetter than normal spring and summer.

## Reporting Details

### Number of Inspections of Power Lines

There is nil to report as there are no aboveground power lines on the Island.

**Table 1 : Data on Bushfire Risk Preparation Works**

Criteria	Target this season	Actual this season	Outstanding from previous seasons	Actual from previous seasons
Line length of the network inspected by the Board in bushfire prone areas within the reporting year.	n/a	n/a	n/a	n/a
Private lines checked by the Board in pre-season inspections by the conclusion of reporting year.	n/a	n/a	n/a	n/a
Number of HV customers advised to undertake pre-season bushfire checks in accordance with ISSC 31	n/a	n/a	n/a	n/a



## Number of Defects Identified or Corrected

There were no defects identified in the underground power lines on the Island.

**Table 2 : Asset defects impacting bushfire risk**

Criteria	Inside bushfire prone areas Cat 1, 2, 3 or 4	Outside bushfire prone areas Cat 1, 2, 3, or 4
Number of identified asset defects impacting bushfire risk within bushfire prone areas that were open at the conclusion of the reporting year.	0	0
Number of directions for bushfire risk mitigation work on private land issued to LV customers by the Board.	0	0

## Number of Fire Ignitions from Network Assets or Private Installations

**Table 3 : Bushfire Starts and Risk Management**

Criteria	Inside bushfire prone areas	Outside bushfire prone areas
Number of report bushfire ignitions by private installations (HV and LV)	0	0
Number of reported bushfire ignitions by the Board's electricity network	0	0
Number of identified vegetation defects open at the conclusion of the reporting year within bushfire prone areas.	0	0
Number of directions for bushfire risk mitigation issued to private LV customers by the Board that are outstanding as of 30 September.	0	0
Number of directions for bushfire risk mitigation issued to private LV customers by the Board that are outstanding by more than 60 days.	0	0
Number of HV customers providing statements of compliance in accordance with ISSC 31 by 30 September.	0	0

## Bushfire Risk Management Actions

There is nil to report as the bushfire risk remains low.

## Audit Reports on the ENSMS

There is nil to report as the Board's ENSMS remains in draft form, and is expected to be audited in December 2017.

## Compliance with IPART Directions

There have been no directions from IPART in relation to Bushfire Risk Management.