

# Electricity Network Safety Management System Guide

14/06/2021

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<b>STAKEHOLDERS</b> The following positions must be consulted if an update or review is required:	<b>NOTIFICATION LIST</b> The following positions must be notified of any authorised change:
<b>Head of Power Systems</b>	<b>Operations Managers</b>
<b>General Manager Operations</b>	<b>Asset Managers</b>
	<b>Works Delivery Managers (or equivalents)</b>
	<b>Project Directors and Managers</b>
	<b>Manager Health and Safety</b>

### RECORD OF REVISIONS

Revision No.	Date	Revised By	Description
0	2/8/2017	Paul Buch	Issued for Use
1	2/8/2017	Paul Buch	Revised with Frazer Nash Consulting Comments
2	9/10/2017	Paul Buch	Revised after Frazer Nash Consulting Health Check
3	8/9/2018	Paul Buch	Revised to address feedback regarding application to Project Management Methodology delivered Projects
4	29/10/2018	Mark Herbert	Revised to clarify Work Management, Project Management Methodology & associated Work Package requirements, Contractor alignment and Organisational Structure changes
5	14/6/2021	Mark Herbert	Amendments to address ENSMS Audit Findings wrt Network Description (1.1), Stakeholder Engagement, Management Review and Change Management. Incorporation of commentary re continual improvement, update of the Competency & Training Guide, and establishment of the significant incident action effectiveness review process. Standalone power systems have been included.

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## 1. INTRODUCTION

Horizon Power is required under the Electricity (Network Safety) Regulations 2015 to have a safety management system for all of its networks that complies with the Australian Standard for Electricity Network Safety Management Systems (AS 5577). This Standard states that network operators must safely manage their Design, Construction, Commissioning, Operation, Maintenance and Decommissioning of their electricity network(s).

The above requirements have been met by Horizon Power by implementing an Electricity Network Management System (ENSMS) via a series of overarching ENSMS elements (statements and procedures) and leveraging existing policies, frameworks, systems and procedures (for example the Corporate Risk Management Framework, Safety and Health Management System and Asset Management System).

Fundamentally Horizon Power's ENSMS requires the design and safe construction, commissioning, operations, maintenance and decommissioning of safe electricity network assets by competent people and documented evidence of this.

This ENSMS Guide is intended to provide key internal and external stakeholders with an appropriate description of the Horizon Power ENSMS, demonstrating how it meets the fundamental principles of the AS 5577 and will achieve the following objectives:

1. Safety of the public, and persons near or working on the network;
2. Protection of property and network assets;
3. Improved safety outcomes related to protection of the environment, including protection from ignition of fires by the electricity network; and
4. Improved safety outcomes related to the loss of electricity supply.

The Guide is intended to be used by employees and contractors to assist in understanding the ENSMS.

### 1.1 Network Description

Horizon Power's Network Assets are those assets utilised to Transmit, Distribute, Monitor and Control the provision of electricity to Horizon Power Customers or the Community, including standalone power systems (SPS) which operate independently from the main electricity network.

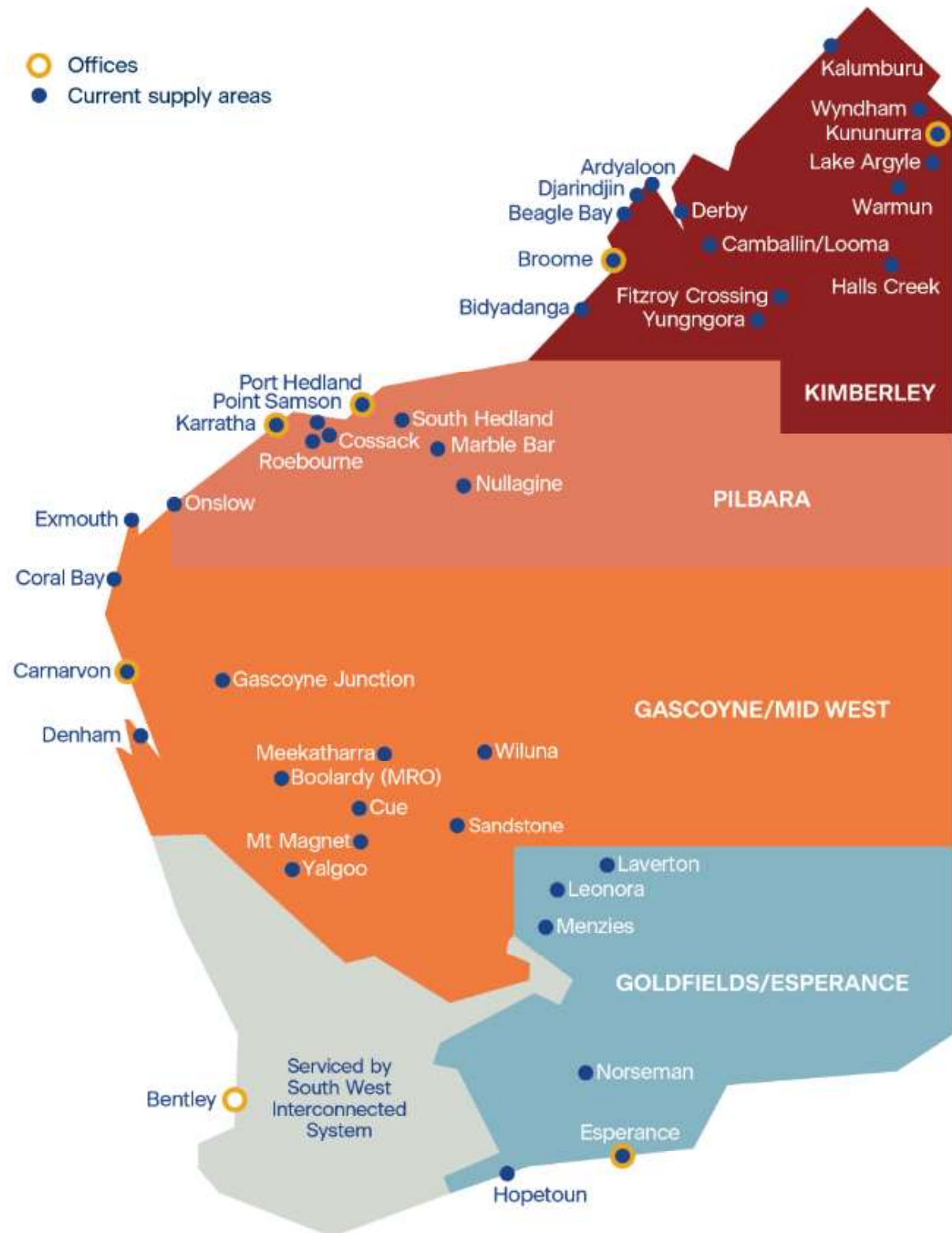
Horizon Power's distribution and transmission networks/systems are known as the Pilbara Grid (North West Interconnected System (NWIS)) and the Microgrid Networks.

The Pilbara Grid / NWIS extends from Karratha to Port Hedland. Power to supply the Pilbara Grid is provided by Independent Power Producers (IPPs).

The Microgrid Networks service towns and regions from Esperance and Hopetoun in the south, through the eastern Goldfields (excluding Kalgoorlie), to the Midwest, Gascoyne and Kimberley regions. Power to supply these Networks is obtained variously from both IPPs and Horizon Power owned generation with Horizon Power being the primary and only Retailer of electricity associated with these Networks.

An outline of the extent of geographical areas covered by Horizon Power's networks, along with selected indicators of the scale of electricity networks is shown below in Figure 1:

Figure 1. Horizon Power Supply Area and Fast Facts





**46,897**

customer accounts – 38,235 residential  
and 8,662 business



**51,117**

customer connection  
points to network



**6**

regional service depots and one  
corporate services office in Perth



**435**

employees



**8,422**

kilometres of overhead and underground  
transmission and distribution lines



**8.29 GWh**

of renewable energy  
credited to customers



**56,345**

distribution poles



**977**

transmission poles and



**871**

transmission towers in service



**1,026.53 GWh**

electricity delivered a year



**0.54 kg**

CO<sub>2</sub>-e / kWh  
carbon emissions



**3** energy types

gas, diesel and renewable energy  
(wind, solar, batteries and hydro)



Network Statistics (30 June 2020):

Transmission (220kV) length	203km
Transmission (132kV) length	114km
Transmission (66kV) length	159km
Transmission Terminal/Substations	13
Above Ground HV Distribution length	4,877km
Below Ground HV Distribution length	933km
Above Ground LV Distribution length	554km
Below Ground LV Distribution length	1,582km
IPP Power Stations (number of)	28
HP Power Stations (number of)	10
SPSs (number of)	24
HV Customers (number of)	61
LV Customers (number of)	47,641 (39,038 residential)

Detailed information pertaining to Horizon Power’s networks, and associated interconnection, is accessible through a number of internally used systems including but not limited to:

- GE PowerOn Advantage (PoA) and associated Peek Distribution Management System (DMS) Viewer, which is Horizon Power’s primary SCADA system. PoA provides operational visibility and control for all of Horizon Power’s networks both the interconnected systems of the Pilbara Grid and the Microgrids.
- ProjectWise, which hosts Horizon Power’s engineering drawings. Within ProjectWise drawings are organised by ‘facility’ which enables users to identify and obtain relevant drawings for all of Horizon Power’s electricity networks.
- GE Smallworld Electric Office (EO) and associated EO Web application, which provides Geographical Information System (GIS) data and Distribution Network Configuration information.

The above resources can be accessed via Horizon Powers intranet (Powerlink: <https://horizonpower.sharepoint.com/sites/Powerlink/technology/Pages/Services-.aspx>).

Horizon Power has adopted a regionalised structure, based on four (4) Regions; Kimberley, Pilbara, Midwest and Esperance. Regional centres are supported by resource structures that encompass Operations, Asset Managers, Works Delivery Managers (or equivalents), Technical and Administrative Support type roles and Field Workers. The main objective of these Regions is to manage their Networks to ensure that Horizon Power delivers safe, reliable and efficient services to our customers.

In addition Horizon Power has a centralised Control Centre (Horizon Power Control Centre (HPCC)) located in the Bentley Office (with remote support from Karratha) that oversees the operation of the NWIS and coordinates fault/emergency response across all Regions. Technical and functional support is also provided to the Regions from the Bentley Office.

Horizon Power’s Organisational Structure changes from time to time to address its risks, opportunities and strategic priorities, details of this structure can be accessed via Horizon Powers intranet (Powerlink: <http://orgchart/OrgChart/>).

## 1.2 Mapping to AS 5577

The following table outlines how the expectations from AS 5577 have been addressed.

AS 5577 Section Reference	AS 5577 Requirements	Mapping
<b>Section 4.1</b> <b>Basis of Section</b>	<p>The ENSMS shall contain the Network Operator’s safety arrangements for the following:</p> <ul style="list-style-type: none"> <li>• ENSMS Policy</li> <li>• Planning</li> <li>• Implementation</li> <li>• Measurement and evaluation</li> <li>• Management review and change management</li> </ul> <p>The ENSMS shall include or refer to a description of the network(s), including or referencing suitable maps showing all network assets and the location of associated facilities such as substations and switching stations.</p>	<b>ENSMS Guide Section 1</b>
<b>Section 4.2</b> <b>Policy and Commitment</b>	<p>The Network Operator shall define its policy and commitment towards the various aspects of operating the network safely.</p> <p>A clear commitment by the Network Operator towards specific outcomes shall form the basis of the ENSMS.</p>	<b>ENSMS Guide Section 2</b>  <b>Safety and Health Policy</b>
<b>Section 4.3.1</b> <b>Planning</b>	<p><b>GENERAL</b></p> <p>The Network Operator shall have appropriate planning processes and procedures for ensuring network safety in any situations that may result from normal and foreseeable abnormal operations including emergencies.</p>	<b>ENSMS Guide Section 3.1</b>
<b>Section 4.3.2</b> <b>Planning</b>	<p><b>PLANNING FOR SAFE OPERATION</b></p> <p>When developing the ENSMS, the Network Operator shall utilize a Formal Safety Assessment undertaken in compliance with this Standard.</p> <p>The ENSMS shall have appropriate processes and procedures for the production of Formal Safety Assessments. The Formal Safety Assessment shall comply with the principles of AS/NZS ISO 31000:2009 and shall include methodologies appropriate to the network under consideration for the following:</p> <ul style="list-style-type: none"> <li>• Establishing the context of the specific assessment being undertaken and including the setting of risk acceptance criteria.</li> <li>• Risk identification—recognizing sources of risk external to the electricity network as well as those arising from the electricity network itself.</li> <li>• Risk analysis, including consideration of the consequences of the risks and the likelihood of the consequences occurring.</li> <li>• Risk evaluation by comparison of the level of risk with risk acceptance criteria.</li> <li>• Risk treatment, including where reasonably practicable the elimination of the source of risk and where elimination is not reasonably practicable, the identification of treatments or controls so that residual risks are reduced to as low as reasonably practicable (ALARP).</li> </ul>	<b>ENSMS Guide Section 3.2</b>  <b>Corporate Risk Management Framework</b>

AS 5577 Section Reference	AS 5577 Requirements	Mapping
	<p>Control measures required to reduce safety risks to the public, property, the environment and network personnel to an acceptable level shall be incorporated into the appropriate procedures.</p> <p>The Network Operator shall ensure that any Formal Safety Assessment carried out considers activities related to the following:</p> <ul style="list-style-type: none"> <li>• Network planning;</li> <li>• Site safety management;</li> <li>• Network safety management incorporating               <ul style="list-style-type: none"> <li>○ network structural integrity;</li> <li>○ external interference management; fault condition monitoring and response; and</li> <li>○ change of operating conditions and remaining asset life review</li> </ul> </li> <li>• Substation's operations and maintenance;</li> <li>• Emergency response.</li> </ul>	
<p><b>Section 4.3.3 Planning</b></p>	<p><b>PLANNING AND PREPARATION FOR ABNORMAL CONDITIONS</b></p> <p>The Network Operator shall plan and prepare for operation of the network in foreseeable abnormal circumstances or during significant disruption to normal operations. These circumstances may include the following;</p> <ul style="list-style-type: none"> <li>• Operating connected to emergency power sources.</li> <li>• Operating without normal supply assets such as power lines or transformers.</li> <li>• Operating at other than normal voltage levels.</li> <li>• Operating under communication outages.</li> <li>• Operating under changed conditions to avoid further damage to the network.</li> </ul>	<p><b>ENSMS Guide Section 3.3</b></p> <p><b>System Operations Procedures</b></p>
<p><b>Section 4.3.4 Planning</b></p>	<p><b>STANDARDS AND CODES</b></p> <p>A Network Operator shall identify the published national or international technical standards used by it in;</p> <ul style="list-style-type: none"> <li>• the design and construction of existing network assets;</li> <li>• design and construction of new network assets; and</li> <li>• the commissioning, installation, operation, maintenance and decommissioning of network assets</li> </ul> <p>If the Network Operator chooses not to use an applicable relevant standard or chooses not to comply with particular provisions of that standard, the Network Operator shall document;</p> <ul style="list-style-type: none"> <li>• the reason for the non-use of or non-compliance with the standard; and</li> <li>• the alternative provisions for the design, construction, commissioning, installation, operation, maintenance and decommissioning of network assets that will ensure a level of safety in relation to those activities that is at least equal to or greater than the level of safety that would ensue from compliance with that standard.</li> </ul>	<p><b>ENSMS Guide Section 3.4</b></p>
<p><b>Section 4.4.1 Implementation</b></p>	<p><b>GENERAL</b></p> <p>The Network Operator shall define how it will implement the ENSMS.</p>	<p><b>ENSMS Guide Section 4</b></p>
<p><b>Section 4.4.2 Implementation</b></p>	<p><b>RESOURCING</b></p> <p>The Network Operator shall identify the resourcing, equipment and material requirements for the network's safe operation and maintenance, including carrying out of hazard controls and mitigation identified in the Formal Safety Assessment. Appropriate resources shall also be identified to ensure the appropriate development, implementation, monitoring and review of the ENSMS.</p> <p>Sufficient personnel should be available for undertaking planned and unplanned operations and maintenance, taking into account the requirements for leave and training.</p>	<p><b>ENSMS Guide Section 4.2</b></p> <p><b>Asset Management System</b></p>

AS 577 Section Reference	AS 577 Requirements	Mapping
Section 4.4.3 Implementation	<p><b>MANAGEMENT STRUCTURE</b></p> <p>A defined management structure for the Network Operator shall be established to identify key positions and/or personnel. The management structure shall be appropriate to the size and complexity of the network.</p>	<p>ENSMS Guide Section 4.3</p> <p>Horizon Power Org. Charts</p> <p>Asset Management System</p>
Section 4.4.4 Implementation	<p><b>RESPONSIBILITIES, ACCOUNTABILITIES AND AUTHORITIES</b></p> <p>The responsibilities, accountabilities and authority levels of personnel and/or contractors, with respect to the various aspects of the design, construction, commissioning, operation, maintenance and decommissioning of the network, shall be detailed in the ENSMS. In particular, personnel shall be identified and documented with the responsibility and authority to:</p> <ul style="list-style-type: none"> <li>• approve policies and procedures;</li> <li>• initiate action to, so far as reasonably practicable: <ul style="list-style-type: none"> <li>○ prevent safety issues arising from a loss of supply;</li> <li>○ prevent environmental impact;</li> <li>○ mitigate the impact of such events to the public; and correct electricity network safety issues;</li> </ul> </li> <li>• identify, record and report on any existing or potential deficiencies within the ENSMS or the network’s design, construction, commissioning, operation, maintenance and decommissioning;</li> <li>• initiate, recommend, approve and monitor corrective and preventive actions in relation to identified existing or potential deficiencies within the ENSMS or the network’s design, construction, commissioning, operation, maintenance and decommissioning;</li> <li>• evaluate and verify the effectiveness of any corrective or preventive action implemented;</li> <li>• satisfy the mandatory approval requirements of this Standard for specific items to be approved.</li> </ul>	<p>ENSMS Guide Section 4.4</p> <p>Regional Responsibility and Accountability Documents</p>
Section 4.4.5 Implementation	<p><b>TRAINING AND COMPETENCY</b></p> <p>The Network Operator shall ensure that all persons involved with the design, construction, commissioning, operation, maintenance and decommissioning of the network are suitably competent and adequately trained to carry out their duties.</p> <p>The Network Operator shall establish and maintain procedures for identifying, facilitating and/or providing the training needs of all personnel operating the network covered by the ENSMS.</p> <p>As a minimum, personnel responsible for the operation and maintenance of the network shall, as applicable to their position, be adequately trained in the obligations of the ENSMS and briefed in the requirements of the controls and actions identified during the Formal Safety Assessment.</p>	<p>ENSMS Guide Section 4.5</p> <p>ENSMS Competency and Training Guide</p>
Section 4.4.6.1 & Section 4.4.6.2 Implementation	<p><b>CONSULTATION, COMMUNICATION AND REPORTING</b></p> <p>The Network Operator shall identify individuals, stakeholder groups and organizations that have a relevant interest in the safety aspects of the design, construction, commissioning, operation, maintenance and decommissioning of the network. These may include, but are not limited to, landowners, employees, employee representative organizations, contractors, utilities, accredited service providers, local and emergency authorities, regulatory authorities and government agencies.</p> <p>The Network Operator shall establish procedures for regular consultation and communication with, and reporting to, these identified stakeholders during the development, implementation and review of the ENSMS. These procedures need to include statutory reporting obligations in line with jurisdictional regulatory requirements.</p>	<p>ENSMS Guide Section 4.6</p>

AS 5577 Section Reference	AS 5577 Requirements	Mapping
Section 4.4.7 Implementation	<p><b>EMERGENCY PREPAREDNESS AND RESPONSES</b></p> <p>The Network Operator shall plan and prepare for emergency events resulting from the network's operation and maintenance and also from external events that may affect the safe operation of the network.</p> <p>In the event of an emergency, the Network Operator shall ensure that any response is performed in a safe manner.</p>	ENSMS Guide Section 4.7
Section 4.5.1.1 Measurement and Evaluation	<p><b>GENERAL</b></p> <p>The ENSMS shall incorporate procedures for the appropriate measurement and evaluation of the performance of the ENSMS elements. The results of audit, review and monitoring processes shall be utilized for the purpose of management review of the ENSMS.</p>	ENSMS Guide Section 5.1
Section 4.5.1.2 Measurement and Evaluation	<p><b>DATA ACQUISITION AND ANALYSIS</b></p> <p>The Network Operator shall establish procedures for identifying, recording and analysing network operational, maintenance and reliability data to identify trends in the network's operation and performance that may affect the safe operation of the electricity network.</p> <p>Analysis of this data should support operation of the network to continue as planned. It should also identify any negative trend that may result in an event adversely impacting the safe operation of the network.</p>	ENSMS Guide Section 5.1
Section 4.5.2 Measurement and Evaluation	<p><b>INCIDENT INVESTIGATION AND CORRECTIVE AND PREVENTATIVE ACTION</b></p> <ul style="list-style-type: none"> <li>• The Network Operator shall establish procedures for identifying, notifying, recording, investigating and reporting accidents and incidents. This shall cover any event associated with the network that either causes or has the potential to cause any one or combination of the following: Death or significant injury to network personnel or the public.</li> <li>• Significant damage to property.</li> <li>• Significant impact on the safe operation of the network.</li> </ul> <p>The Network Operator shall develop and implement procedures for determining, approving and implementing corrective and preventative actions.</p> <p>The agreed actions shall, as far as reasonably practicable, eliminate or mitigate the identified hazard and shall be appropriate and commensurate to the risk identified. The agreed actions shall be documented and their implementation monitored and confirmed.</p>	ENSMS Guide Section 5.2  Horizon Power Incident Investigation Procedure
Section 4.5.3 Measurement and Evaluation	<p><b>RECORDS</b></p> <p>The Network Operator shall implement relevant records management arrangements for the following:</p> <ul style="list-style-type: none"> <li>• Control of documents, legislation, standards, codes, guidelines and procedures required for the safe design, construction, commissioning, operation, maintenance and decommissioning of the network.</li> <li>• Maintenance of asset records including, but not limited to, maps, databases, designs and as-built drawings.</li> <li>• Maintenance of commissioning, operation, maintenance and audit records.</li> <li>• Maintenance of records relating to the ENSMS and revisions to it.</li> <li>• Systems for storage and retrieval of records.</li> <li>• Accident/incident records.</li> </ul>	ENSMS Guide Section 5.3

AS 5577 Section Reference	AS 5577 Requirements	Mapping
<b>Section 4.5.4 Measurement and Evaluation</b>	<p><b>SYSTEM AUDITS</b></p> <p>The Network Operator shall establish procedures for planning and implementing audits to determine the Network Operator's compliance with, and the effectiveness of, the ENSMS's plans and procedures. System audits should also assess compliance with regulatory requirements and ensure the ENSMS adequately addresses these issues.</p> <p>The Network Operator shall consider the hazards identified and risks evaluated in the Formal Safety Assessment to ensure that audits evaluate;</p> <ul style="list-style-type: none"> <li>• the effectiveness of the ENSMS in controlling the risks identified; and</li> <li>• the effectiveness of the monitoring procedures in place to identify new or changed hazards and risks.</li> </ul> <p>Audits shall be performed by competent personnel who are independent of the section of the ENSMS being audited. The audit procedures shall cover the timing of audits, including the conduct of external independent audits where chosen or where required by regulatory authorities.</p> <p>The outcomes of audits shall be subject to management review.</p>	<p><b>ENSMS Guide Section 5.4</b></p> <p><b>ENSMS Compliance and Audit Guide</b></p>
<b>Section 4.6.1 Management Review and Change Management</b>	<p><b>MANAGEMENT REVIEW</b></p> <p>The Network Operator shall establish procedures for regular management review of the effectiveness and appropriateness of the ENSMS.</p>	<p><b>ENSMS Guide Section 6.1</b></p>
<b>Section 4.6.2 Management Review and Change Management</b>	<p><b>CHANGE MANAGEMENT</b></p> <p>The Network Operator shall establish procedures for managing changes to the ENSMS, procedures, network design, construction, operation, maintenance and decommissioning so that they are made in a controlled manner, reviewed, recorded and approved by the Network Operator.</p> <p>Any change to the network or its operating context shall be reviewed and approved by the Network Operator. Change shall be considered to have taken place if the engineering design has been upgraded or modified.</p> <p>The change management procedures shall address implementation of any resulting ENSMS changes, including notification and training of staff impacted by the change and the allocation of responsibilities for any identified actions. The change management procedures shall also include communication of changes to relevant stakeholders.</p>	<p><b>ENSMS Guide Section 6.2</b></p> <p><b>SHMS Change Management Principle and Procedure</b></p>

## 2. POLICY AND COMMITMENT

Horizon Power has an established Safety and Health Policy, which incorporates the Electricity Network Safety Management System.<sup>1</sup>

## 3. ENSMS PLANNING

### 3.1 Planning General

Horizon Power has an established range of systems and processes to support its operations. These include the Safety and Health Management System, the Asset Management System plus discreet system operations procedures to deal with normal and anticipated abnormal

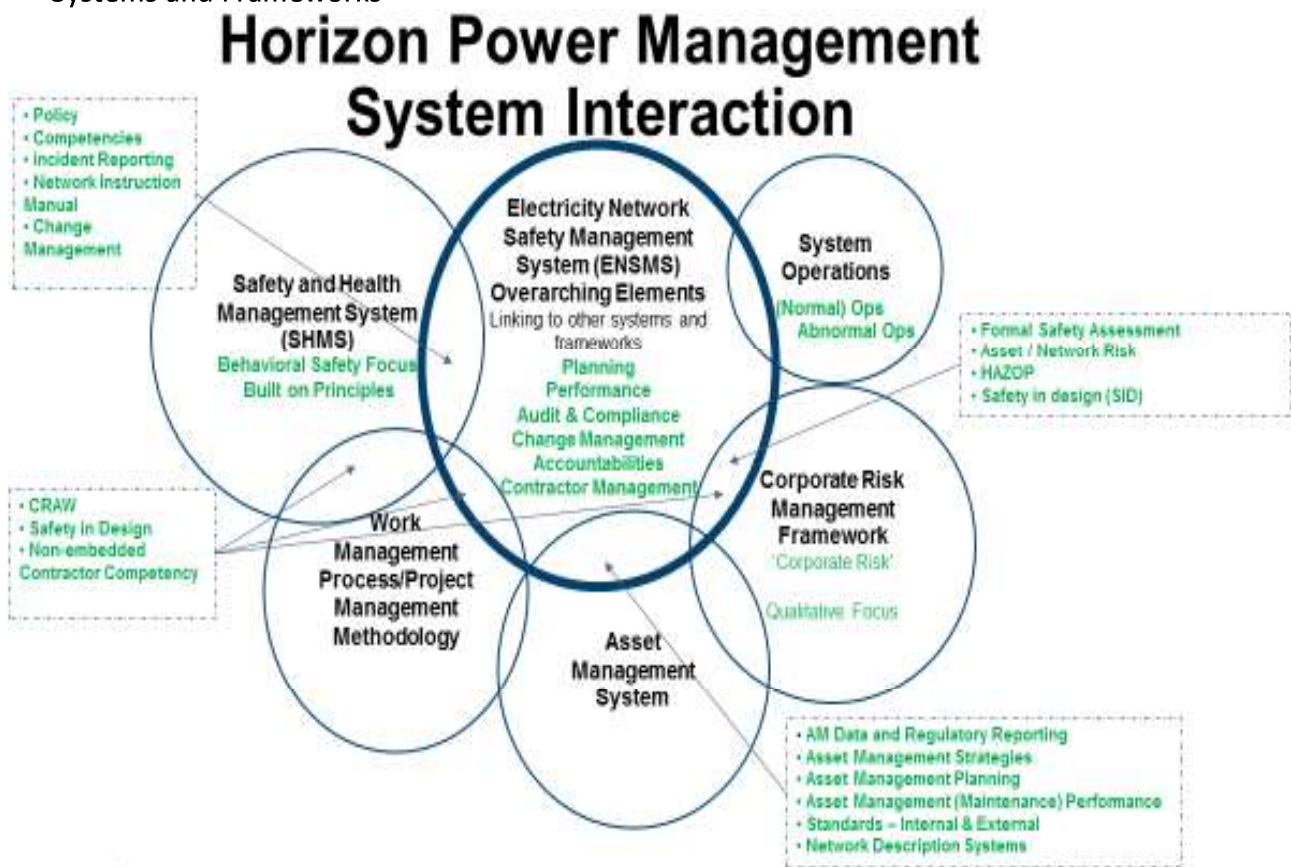
<sup>1</sup> Safety and Health Policy Document Number: OSH-1-1-01 rev 1 - DM#[4048166](#)

circumstances. Horizon Power has also established emergency management and response processes, which are discussed in Section 4.7 of this guide.

Horizon Power has developed and implemented its ENSMS in a manner that leverages and integrates with these existing, established frameworks and systems. The most significant linkages are to; System Operations, the Corporate Risk Management Framework (CRMF), the Safety and Health Management System (SHMS), the Project Management Methodology (PMM) and the Asset Management System (AMS). The figure below (Figure 2) illustrates how the ENSMS, System Operations, SHMS, AMS, PMM and CRMF are integrated.

In combination, these systems and frameworks provide the facilities and processes to manage the safe, design, construction, operation, maintenance and decommissioning of Horizon Power’s Networks

Figure 2. Venn diagram illustrating integration of selected Horizon Power Management Systems and Frameworks



Rev 4 17 October 2018

### 3.1.1 Safety and Health Management System

The Health and Safety Policy provides the principles for management and guidance of safety and health at Horizon Power and commits to minimising the risk of harm to our people and

the community to ALARP. The process applies a multi-faceted approach to promote a positive safety and health culture by the development and maintenance through:

- A Safety and Health Strategy
- A Safety and Health Management System
- Safety non-negotiables
- Electricity Network Safety Management System
- Safety and health plans and work methods

The details of the Safety and Health policy, process and principles are articulated in:

- Safety and Health Policy<sup>2</sup>
- Safety and Health Management System Manual<sup>3</sup>

The principles of the system are:

- Principle 1 – Leadership, Commitment and Accountability
- Principle 2 – Management of Risk
- Principle 3 – Incident Management
- Principle 4 – Consultation and Communication
- Principle 5 – Occupational Health
- Principle 6 – Contractors and Suppliers
- Principle 7 – Emergency Preparedness and Response
- Principle 8 – Documentation and Data Management
- Principle 9 – Inspection, Monitoring and Auditing
- Principle 10 – Training, Competency and Behaviours
- Principle 11 – Planning, Objectives and Targets
- Principle 12 – Change Management
- Principle 13 – Management Review

The Health and Safety System focuses on the management of people risk and is supported by the Asset Management System.

### **3.1.2 Asset Management System**

The Asset Management Strategy and System<sup>4</sup> creates the framework by which the Operational Businesses review the performance of assets to identify improvement opportunities and risks plus develop plans so that risks are managed / minimised and value optimised.

The Asset Management Strategy outlines how the Asset Management System and its associated activities are aligned with the *corporate vision* and management of intergenerational assets.

The Asset Management Strategy details the objectives and drivers for the selection and delivery of works on the asset whilst balancing costs, opportunities and risks against the desired level of service. The Asset Management Strategy also provides guidance to the regionally based and focussed Asset Managers to develop Asset Management Plans and

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<sup>2</sup> OSH-1-1-01 Safety and Health Policy – DM#[4048166](#)

<sup>3</sup> Safety and Health Management System Manual – DM#[2792747](#)

<sup>4</sup> Horizon Power's Asset Management Strategy and System - DM#[2772490](#)



ultimately operating plans and budgets for the business. A readily accessible guide is provided through a series of attachments to the Horizon Power's Asset Management Strategy and System document that gives detailed descriptions and references to assist Asset Managers to undertake their accountabilities, specifically in relation to the development and execution of the asset management plan.

### **3.1.3 Corporate Risk Management Framework**

Horizon Power has a Corporate Risk Management Framework which provides the foundations and strategy to embed, manage and support risk management throughout the organisation. The purpose of the framework is to ensure consistency and integration of risk management practices throughout the business at all levels. It is the authoritative document on risk management processes and practices throughout the organisation and details how Horizon Power governs and monitors its risks. ENSMS Risk Assessment and Management is undertaken in manner that is consistent with this framework.

### **3.2 Network Safe Work Practices and Procedures for Normal Operations**

The industry and company codes used by Horizon Power in the construction, commissioning, operation, maintenance and decommissioning of network assets are contained in the Safety and Health Management System Horizon Power Instructions Manual<sup>5</sup> and the Horizon Power Control Centre instructions.

Design, construction, commissioning, operations, maintenance and decommissioning of Network assets can be undertaken using either the Work Management Process (& Standard Work Packages) if performed by Regions or approved Project Management Methodology if performed by others.

Work undertaken via Network Maintenance Services Contracts utilise Standard Work Packaging as the means to brief the Contractor and for the Contractor to provide feedback on completed work.

Assets modified or created by others using Project Management Methodology will be handed over to the Region along with Standard Handover Documentation.

The Field Instructions within the Horizon Power Instructions Manual set the standard of work practices and procedures for all employees, contractors and sub-contractors working on the Horizon Power electricity network, such as the Safe Work procedures and the Networks Permit to Work Instructions. The Safety and Health team is responsible for the development, review and update of the Field Practices to meet the changing needs of the network.

The Horizon Power Control Centre (HPCC) manages the operation of the Pilbara Grid - North-West Interconnected System (NWIS) and the Microgrids that service the other regions of Western Australia. The HPCC manages faults and electricity supply issues, monitors supply and demand to ensure that there is enough electricity to meet customers' needs at any time, all within the specified voltage, frequency and quality limits. HPCC also implement switching programs that turn off or divert electricity around the network so line crews can safely maintain, repair and upgrade infrastructure. HPCC is responsible for the management of open points; any change in open points will be done as part of a switching

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<sup>5</sup> Horizon power Instructions Manual – [Powerlink](#)

program (upon completion of the switching program, the HPCC operator is prompted to accept and confirm any change made to open points in the network.).

The HPCC maintains a catalogue of work instructions to support normal operations. These can be found in Horizon Power's Document Management System.

HPCC's Supervisory Control and Data Acquisition (SCADA) encompasses operational technology to provide remote real time visibility, control and data acquisition from Horizon Power network and generation assets.

Some examples of the functions provided by SCADA systems are:

- Network Management System (NMS) (includes Network Access)
- Outage Management System (OMS) (includes Fault notification and Dispatch)
- Generation Management and Dispatch (includes Power Station control)
- Data Acquisition and Storage
- Switching Program Writing and Safety Logic (includes automatic checking of switching programs to ensure no risk to personnel or network stability)

### **3.2.1 Risk Identification, Assessment and Management**

The Horizon Power Corporate Risk Management Framework provides the foundations and strategy to embed, manage and support risk management throughout the organisation. The purpose of the framework is to ensure consistency and integration of risk management practices throughout the business at all levels.

Horizon Power is committed to maintaining a comprehensive, integrated and effective Risk Management Framework consistent with AS/NZS ISO 31000:2009. Horizon Power's business wide risks, policy, framework and matrix sets the business tolerance and appetite for risk and is detailed in:

- Risk Management Policy<sup>6</sup>
- Horizon Power Corporate Risk Framework<sup>7</sup>
- Corporate Risk Matrix<sup>8</sup>

Horizon Power's Corporate Risk Framework set the business wide framework for management of risk and establishes the risk appetite. To achieve an effective risk management system, safety risk is managed in a number of processes:

- The Horizon Power Board will accept a Medium residual risk rating for identified risks. Where the exposure relates to safety risks the Board requires that Horizon Power demonstrate that the exposure is reduced to the more conservative standard of As Low As Reasonably Practicable ("ALARP"), or good industry practice.
- Business wide risk. The Corporate Risk Management system sets a consistent business wide framework for managing risk across the business.

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<sup>6</sup> Risk Management Policy - DM#[2760082](#)

<sup>7</sup> HP Corporate Risk Framework - DM#[2760190](#)

<sup>8</sup> Corporate Risk Matrix - DM#[1522391](#)

- Safety and Health Management System. The Safety and Health Management System sets a consistent system for managing safety risk across the business, including tactical job oriented risk management.
- Formal Safety Assessments (FSA). Horizon Power has selected a suite of Guided Assessment methodologies to conduct Formal Safety Assessments over the network life cycle. FSA's are used to; identify the hazards from assets and processes, evaluate the risk and identify additional controls that may be considered in managing the risk. They support the ENSMS goals that are to:
  - Ensure the safe operation of the electricity network
  - Protect public safety
  - Prevent high consequence events (i.e. fatalities, fire)
  - Protect property and the network assets
  - Comply with legislation

The whole of life cycle approach to Formal Safety Assessments is outlined in the following table.

FSA Approach	Distribution	Transmission	Emergency/Interim Generation
Prescribed Work			
Design	Safety in Design (for larger jobs) or, Guided Assessment (Asset Design FSA's) with Design Safety Checklist + Asset Interaction Sheet + Location FSA	Full Life Cycle HAZOP or, Safety in Design (for smaller jobs) + Asset Interaction Sheet + Transmission Location FSA	Full Life Cycle HAZOP or, Safety in Design (for smaller jobs)
Construction	Construction Risk Assessment Workshop (for larger jobs) or, Job Risk Analysis + Asset Interaction Sheet + Location FSA	Construction Risk Assessment Workshop (for larger jobs) or, Job Risk Analysis + Asset Interaction Sheet + Transmission Location FSA	Job Risk Analysis
Commissioning	Job Risk Analysis	Job Risk Analysis	Job Risk Analysis
Operate	Switching Review Risk Assessment + Job Risk Analysis	Switching Review Risk Assessment + Job Risk Analysis	Job Risk Analysis
Maintain	Asset Interaction Sheet + Location FSA (when a design has been conducted) + Job Risk Analysis	Asset Interaction Sheet + Transmission Location FSA + Job Risk Analysis	Job Risk Analysis
De-Commissioning	Job Risk Analysis	Job Risk Analysis	Job Risk Analysis

The FSA suite is divided into the following categories.

- Distribution Assets – an asset design FSA utilising a guided assessment has been undertaken for distribution asset types that are subject to routine interaction. These are supplemented by location FSA's as 'safe designs' are implemented in the field. The location FSA is performed by utilising the Asset Interaction Sheet (AIS). There is a documented FSA procedure<sup>9</sup> in place.
- Transmission Assets – a HAZOP study methodology has been undertaken to the level of Single Line Diagram's (SLD's) for the Pilbara Grid transmission assets. This study looks at all deviations from normal operating conditions or design parameters and includes node by node, line by line and deviation by deviation, supplemented by bow tie analysis for selected high priority risk events.

<sup>9</sup> Formal Safety Assessment Procedure - #4921337

- Emergency/Interim Generation Assets – a HAZOP study methodology has been undertaken to the level of Process and Instrumentation Diagrams (P&ID's) and SLD's for the Kununurra standby generation facility. This study looks at all deviations from normal operating conditions or design parameters and includes node by node, fuel source, deviation by deviation, supplemented by bow tie analysis for selected high priority risk events. Other, less frequently used emergency generation facilities will be assessed subsequently.
- Larger/more significant projects – the Safety in Design (SiD) methodology will be employed. This has been integrated into the Horizon Power Project Management Methodology. The SiD activity is expected to address the full anticipated life cycle of the assets including Construction, Commissioning, Operation, Maintenance and Decommissioning. Construction Safety planning will be further progressed through the application of the Construction Risk Assessment Workshop (CRAW) process.

Horizon Power requires its personnel and contractors to apply the FSA's to hazards in the workplace, assess risk and implement controls to ensure the safety of employees, contractors and the public and reduce any damage to property and the environment surrounding the network.

### **3.3 Abnormal Operations**

As with Normal Operations, the Horizon Power Control Centre (HPCC) maintains and utilises a catalogue of safe work instructions relating to abnormal operations. The table below outlines these instructions and demonstrates how they address the five (5) particular circumstances listed in section 4.3.3 of AS-5577:2013:

- (a) Operating connected to emergency power sources
- (b) Operating without normal supply assets such as power lines or transformers
- (c) Operating at other than normal voltage levels
- (d) Operating under communication outages
- (e) Operating under changed conditions to avoid further damage to the network

DM #	Name of the document	(a)	(b)	(c)	(d)	(e)
<a href="#"><u>4282671</u></a>	HPCC Business Continuity Plan				X	
<a href="#"><u>1786598</u></a>	Power Transformer Overload					X
<a href="#"><u>1786561</u></a>	Reclosing of circuits following unplanned outages					X
<a href="#"><u>0569030</u></a>	NWIS Real Power Spinning Reserve	X				
<a href="#"><u>1786244</u></a>	Capacitors and Reactors under Direct Control	X		X		X
<a href="#"><u>1786569</u></a>	Under Frequency Load Shedding Scheme (NWIS)		X	X		X
<a href="#"><u>1833029</u></a>	NWIS Black Start Procedure		X			X
<a href="#"><u>1786235</u></a>	Reactive Power Spinning Reserve and control	X		X		X
<a href="#"><u>1786605</u></a>	Transmission Line Overload					X
<a href="#"><u>1833083</u></a>	Operation of the North West Interconnected System		X	X		X
<a href="#"><u>1784265</u></a>	Severe Weather / Total Fire Ban, Fire Danger Rating Notification					X
<a href="#"><u>2600301</u></a>	Gas Curtailment		X			
<a href="#"><u>1794556</u></a>	ENMAC Network Management Procedure				X	
<a href="#"><u>4358837</u></a>	Fitzroy load area black start		X			X
<a href="#"><u>4359665</u></a>	Esperance load area black start		X			X
<a href="#"><u>4360542</u></a>	Exmouth load area black start		X			X
<a href="#"><u>4358832</u></a>	Broome load area black start		X			X
<a href="#"><u>4358691</u></a>	Carnarvon load area black start		X			X
<a href="#"><u>4350811</u></a>	Derby load area black start		X			X
<a href="#"><u>4350196</u></a>	Emergency Procedure - Severe Storm, Cyclone, Flood And Bushfire Response	X	X		X	X

### 3.4 Standards and Codes

The industry Standards and codes related to the electrical networks that are applied by Horizon Power are listed in Appendix 1. Internal standards and codes are referenced within the relevant sections of this guide.

## **4. IMPLEMENTATION**

### **4.1 General**

Horizon Power has developed and implemented its ENSMS in a manner that leverages and integrates with existing, established frameworks and systems. The most significant linkages are to the Corporate Risk Management Framework, the Safety and Health Management System and the Asset Management System. The integration of these systems is discussed in section 3.1 of this guide.

### **4.2 Resourcing**

The primary process for resourcing Horizon Power's ENSMS is the Asset Management Planning process which is the key driver of annual works planning and associated Operating & Capital budgeting. This process is described in the Horizon Power Asset Management Strategy<sup>10</sup> and the Asset Management Plan Instruction Guide<sup>11</sup>.

The Asset Management Planning process frames the assignment of financial (including equipment and materials) plus human resources. Asset risk is a key influencing parameter in determining required resources for the upcoming financial year.

Assigned resourcing may be provided through the allocation of permanent employees, temporary employees, embedded (Contract of Service) Contractors or package delivery (Contract for Service) Contractors.

#### **4.2.1 Permanent Employees**

Permanent employee numbers are assigned based on the longer term workload forecast for each region and/or function.

#### **4.2.2 Temporary (Fixed Term) Employees**

Temporary (Fixed Term/Maximum Term) employees are utilised when 'campaign' resourcing is required to achieve a particular medium term objective.

#### **4.2.3 Embedded (Contract of Service) Contractors**

Embedded (Contract of Service) Contractors are added to existing Horizon Power teams to provide short/medium term surge resourcing and/or to cover employee unavailability. Personnel deployed under this model are managed and supervised in the same way as Horizon Power employees, with full authorisation being required and full compliance with all Horizon Power management systems being expected.

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<sup>10</sup> Horizon Power Asset Management Strategy and System – DM#[2772490](#)

<sup>11</sup> Asset Management Plan – Instruction Guide – DM#[1901117](#)

#### **4.2.4 Contract for Service Contractors**

Contract for Service Contractors are used for larger or more discreet packages of work, which can be fully defined such that the assigned contractor is able to deliver the full scope of work with minimal interaction with other Horizon Power work teams. This model is the primary resourcing approach for larger projects.

In this mode of delivery the engaged contracting organisation is expected to demonstrate to the contract manager prior to engagement how they will ensure competent employees/subcontractors will be used to safely deliver network assets that are safe and integrated with HP's systems and processes.

Under this mode of delivery the engaged contracting organisation may be authorised as part of their engagement to apply their own management systems providing these systems are assessed as being at least risk equivalent of Horizon Power's systems. Where a Contract for Service Contractor's management systems is deemed to not achieve risk equivalency, or their activities are taking place on operating Horizon Power sites and are tightly integrated with Horizon Power activities, then Horizon Power's SHMS/ENSMS processes and expectations will apply.

Whichever management systems are applied, contractors are obliged (by regulation) to comply with the contractor requirements of Electricity (Network Safety) Regulations 2015 and the Occupational Safety and Health Regulations 1996.

### **4.3 Management Structure**

Horizon Power has adopted a regional operating and asset management structure, support by centralised functions designed to provide corporate and functional services to the operating regions.

Horizon Power organisation charts are available through the Horizon Power intranet on 'Powerlink'<sup>12</sup>.

#### **4.4 Responsibilities, Accountabilities and Authorities**

Responsibilities, Accountabilities and Authorities are outlined in Position Descriptions and the Authorities and Delegations Manual<sup>13</sup>.

##### **4.4.1 ENSMS Roles and Accountabilities**

ENSMS roles and accountabilities can be divided into roles and accountabilities associated with working within the system (i.e. work directly associated with electrical networks) and roles and accountabilities associated with working on the system (i.e. review, monitoring and improvement of the ENSMS).

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<sup>12</sup> Horizon Power Organisational Chart – [Powerlink](#)

<sup>13</sup> Authorities and Delegations Manual – DM#[1895846](#)



Roles working within the system are largely regionally based or project based. These roles and accountabilities are outlined in Accountabilities and Responsibilities Framework<sup>14</sup> documents prepared and maintained for each region plus the Bentley based central Asset Management and Engineering resources.

#### **4.5 Training and Competency**

All personnel undertaking prescribed activities (design, construction, commissioning, operation, maintenance and decommissioning of the network) must be suitably competent and adequately trained.

The vastness of geographic area of the Horizon Power network combined with the regional operational model has led to the development of competencies that align to activities rather than organisational positions. The activity based competencies are;

1. Asset Design – capable to design a new network design object or structure;
2. Network Design – capable to design a new network section, augment or replace an existing network portion or asset using already approved design objects and structures,
3. Works Oversight / Constructor – capable of managing activities associated with the network asset works management process.
4. Asset Management – capable of managing activities associated with the asset management process.
5. Network Operations – capable of operating and configuring the electrical system to minimize outages and manage system performance.
6. Field Work – capable of undertaking work on network assets in the field associated with construction, commissioning, maintenance, operation and decommissioning.
7. Works and Project Support – capable of providing administrative services, coordination support and systems support to both the Works Oversight and Field Work functions.
8. Technical Engineering – capable of providing technical asset engineering activities and services to support the design, construction, commissioning, operation, maintenance and decommissioning of the network.
9. Planning Engineering – capable of providing system and network planning and associated analytical services to support the design, construction, commissioning, operation, maintenance and decommissioning of the network.
10. General – all other employees and contractors who touch the network asset lifecycle or are involved with the prescribed activities.

The ENSMS Competency and Training Guide<sup>15</sup> provides the processes to be followed to manage competency requirements.

#### **4.6 Communications and Consultation**

The following table outlines target groups for consultation and associated consultation mechanisms.

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<sup>14</sup> Asset Management Processes – DM#[5358918](#)

<sup>15</sup> ENSMS Competency and Training Guide – DM# [5382011](#)

Stakeholder Group	Consultation
Energy Safety	<ul style="list-style-type: none"> <li>Regulatory Compliance and Assurance (Electricity Acts and Regulation).</li> <li>Routine quarterly meeting between Director Energy Safety and Head of Power Systems, routine quarterly meeting between Senior Compliance &amp; Performance Engineer and Chief Electrical Inspector Supply &amp; other from Energy Safety and adhoc meetings with ES Officers to maintain open dialogue.</li> <li>Quarterly, Annual and Statutory Reporting with respect to Network Safety Performance Objectives, Notifiable and Reportable Electrical Safety events. (NB there is no statutory requirement to report on the adequacy or performance of the ENSMS)</li> </ul>
Employees	<ul style="list-style-type: none"> <li>Understanding of the requirements of the ENSMS and its effectiveness and efficiency of application (ie how well it works for them) to ensure their safety and regulatory obligations are satisfied.</li> <li>Daily (Prestart), Weekly and Monthly Team Meetings, routine newsletters via email, specific information sharing and feedback session as required when key changes are proposed or are made to the ENSMS, ENSMS Intranet Page (<a href="https://horizonpower.sharepoint.com/sites/Powerlink/safety/ensms">https://horizonpower.sharepoint.com/sites/Powerlink/safety/ensms</a>), online ENSMS Suggestion Mechanism (<a href="mailto:ENSMS@horizonpower.com.au">ENSMS@horizonpower.com.au</a>), input from SMEs for FSA development.</li> <li>No formal reporting requirement however performance of the ENSMS is conveyed through the Operating Management System KPIs that reflect Electrical Safety Events and therefore effectiveness of the ENSMS.</li> </ul>
Contractors	<ul style="list-style-type: none"> <li>Understanding of the requirements of the ENSMS to ensure their safety and regulatory obligations are satisfied (i.e. provides contractors with the required information to ensure they can comply with the Horizon Power ENSMS and their own SMS when conducting work on Horizon Power's Network).</li> <li>Notification via Tendering process of ENSMS requirements, access via Horizon Power Website of key ENSMS documentation, provision of ENSMS Training to contractors, prestart briefings for works, identification of hazards and controls via FSA/Safety in Design Procedures.</li> <li>No formal reporting of ENSMS Performance to Contractors however contractors must provide monthly data on their safety performance and report all Electrical Safety (Notifiable/Reportable) events.</li> </ul>

<p>Customers &amp; Community</p>	<ul style="list-style-type: none"> <li>• Understanding of our customers' and the community's needs and desires with respect to "safe" service provision (quality and continuity of supply, Network Hazards – faults and design) and advice to customers on how they can help control hazards. Special interest groups include Life Support Customers/Medical Community, Farm Owners/Workers, Medium and Large Enterprise Customers, CCI. For Life Support Customers we have an obligation to advise them of outages and not to disconnect them for non-payment of charges.</li> <li>• Horizon Power's Retail &amp; Engagement facilitates engagement with the community at large and with special interest groups via various channels to understand their desires, communicate our approach and form working relationships. Specific public safety campaigns are run annually based on risk and current trends such as tap tingle, fallen wires, rural awareness of network assets, etc. Routine Customer Surveys are performed to understand Customer needs, wants and experience. HPCC interact via formal State incident management/disaster recovery networks and mechanisms to ensure safe and reliable service, which involves communicating our risks and controls and responding accordingly to the broader community need. Horizon Power's Project Management Methodology outlines the community consultation where network changes have potential or actual external impacts. All of these interactions are relied upon in some form or another to shape our ENSMS and feed into its application as necessary.</li> <li>• Regulatory Reports to Energy Safety are posted on our external website as is our Corporate Annual Report which includes details of our Network Safety Performance.</li> </ul>
<p>Industry Participants</p>	<ul style="list-style-type: none"> <li>• Horizon Power maintains a close relationship with Western Power along with other industry association (ENA, Standards Australia, etc) and industry participants in the Eastern States to understand industry practice and trends.</li> <li>• Membership of committees, attendance at industry forums, webinars are all used to maintain the relationships, share information and achieve the above.</li> <li>• No formal reporting.</li> </ul>

## 4.7 Emergency Preparedness

The Business Continuity Management (BCM) Framework defines the processes and controls that ensures that Horizon Power is proactive in preventing and preparing for disruptive events.

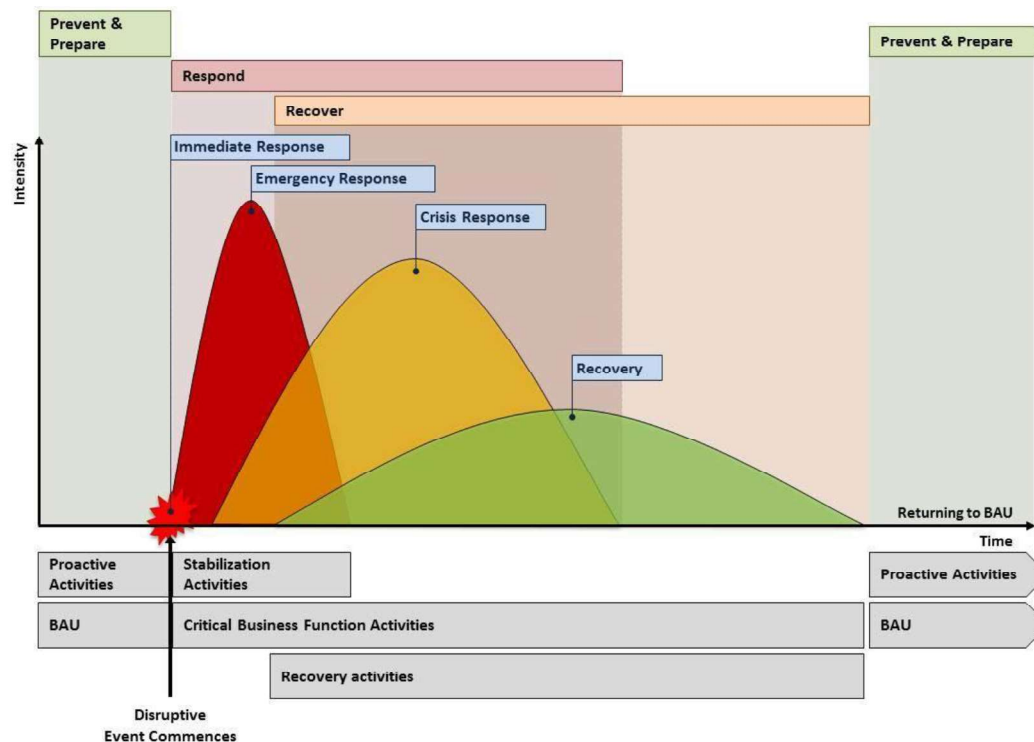


Figure 3. Horizon Power's Business Continuity Framework

### 4.7.1 Prevent and prepare for an emergency or crisis.

The planning comprises 4 phases as described below.

- **Phase 1 - Risk assessment & business impact analysis**

	Templates
<a href="#">2755849</a>	Risk Management Matrices
<a href="#">3704096</a>	Risk Bow tie template
<a href="#">2757200</a>	Risk register Template
<a href="#">3717969</a>	BIA template
	<b>Business Impact Analysis</b>
<a href="#">3719882</a>	Horizon Power Control Centre Business Impact Analysis

- **Phase 2 - Identify response options**  
Response options are developed to address the contingency event under consideration.

- **Phase 3 - Develop response plan**

The table below identifies the established Horizon Power Emergency Response Plans.

<b>Horizon Power Emergency Plans</b>	
<u>5100083</u>	Kimberley Emergency Response Procedure
<u>3133052</u>	Karratha Depot Emergency Response Plan
<u>3000209</u>	Carnarvon Distribution Emergency Response
<u>9122357</u>	Esperance Depot Emergency Response
<u>3133053</u>	Port Hedland Power Station Emergency Response
<u>3000241</u>	Emergency Procedures Denham Power Station
<u>3002223</u>	Emergency Procedures Marble Bar Power Station
<u>3002224</u>	Emergency Procedures Nullagine Power Station
<u>14289345</u>	Emergency procedure severe storm, cyclone, flood and bushfire response

Business continuity plans, including contingency and recovery plans

<b>HP Business Continuity Plans</b>	
<u>4282671</u>	Horizon Power Control Centre Business Continuity Plan
<b>HP Contingency Plans</b>	
<u>2603476</u>	Esperance District Contingency Plan
<u>14289431</u>	Gascoyne Network Contingency Plan
<u>4971117</u>	Kimberley District Contingency Plan
<u>14290335</u>	Midwest Network Contingency Plan
<u>5251768</u>	Pilbara Network Contingency Plan
<u>2744224</u>	NWIS Transmission Contingency Plan

- **Phase 4 - Testing and maintenance**

Emergency procedures and contingency plans are routinely tested and revised to ensure relevance and currency. This is detailed in the Emergency Procedure Severe Storm, Cyclone, Flood and Bushfire Response procedure.

#### **4.7.2 Respond to, and recover from, an emergency or crisis.**

Horizon Power has three tiers of response to an incident and the activation of each response is dependent on the severity of a disruptive event. These tiers are:

- Emergency Response – Focused on safeguarding people, assets and the environment;
- Emergency Management – Focused on managing moderate consequence events and involves operational decision-making; and

- Crisis Management – Focused on managing high or extreme events and involves strategic decision-making.

The process and decision points for activating any tier of response are undertaken by line management.

In the recovery phase, activated teams will take steps to re-establish critical business processes and ultimately return Horizon Power to its business-as-usual state. At times, it may be more appropriate for a management team to commission a separate recovery team to undertake recovery tasks.

The recovery phase often occurs in parallel with the response phase.

The Horizon Power Crisis & Emergency Management Handbook provides guidance.

## 5. MEASUREMENT AND EVALUATION

### 5.1 Measurement and Evaluation General

Horizon Power has established the ENSMS Management Working group to monitor and evaluate the performance and effectiveness of Horizon Power's ENSMS. The Terms of Reference<sup>16</sup> governs how the ENSMS Management Working Group operates.

#### 5.1.1 Data Acquisition and Analysis

One of the responsibilities of the ENSMS Management Working Group is to monitor and review ENSMS performance, including monitoring the selected Key Performance Indicators (KPI's). Initial KPI's are to be drawn from:

- Cintellate Incidents related to Assets and/or the ENSMS
- ENSMS Compliance Monitoring
- Regulatory Reporting data, (this includes the reporting of performance against annual network safety performance objectives)
- Asset related risk trends
- Any highlighted ENSMS operational issues
- Selected Asset Management Data

### 5.2 Incident investigation

The Incident Investigation Procedure<sup>17</sup> OSH-4.2-1-02 defines Horizon Power requirements for the investigations of Incidents to ensure compliance with relevant legislation and company policies. It includes the use of ICAM Incident Cause Analysis Method.

The procedure describes steps to be taken for all Safety and Health incidents. It can also be used as a guide to conduct investigations for the incidents that are defined in the Electricity (Network Safety) Regulations 2015 as "notifiable incidents", however not all of them will require the use of ICAM, a less onerous root cause analysis process is acceptable.

Incident investigations shall be initiated as promptly as possible, but no later than 48 hours following the incident. This is the accountability of the Regional Manager.

All incidents should be investigated and analysed. The extent of the analysis will vary depending on the severity of the incident.

Incident investigation team membership and accountabilities are presented in the Incident Investigation Procedure OSH-4.2-1-02.

An incident investigation report shall be prepared using the Incident Investigation Report Template<sup>18</sup> OSH-4.2-4-1, the Notifiable Incident Report Template or the Notifiable Incident Summary Template as appropriate.

Network Incident reports shall be shared through the Safety and Health team and Asset Management team, and the supply chain, as appropriate. All network incident reports shall

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<sup>16</sup> ENSMS Working Group Terms of Reference – DM#[5339602](#)

<sup>17</sup> Incident Investigation Procedure OSH-4.2-1-02 - DM#[2838057](#)

<sup>18</sup> Horizon Power Investigation Report Template - DM#[2895816](#)

be entered into the corporate incident tracking system in accordance with Horizon Power Record Keeping Plan<sup>19</sup>.

Significant learnings from network incidents should be integrated into network and asset management policies, field instructions, and other regional management systems as applicable to achieve sustainable prevention.

Incident performance shall be analysed for trends on an ongoing basis, including the type of incident, characteristics of operational discipline involved, type of equipment involved, asset involved, and other pertinent factors. The focus shall be on (1) prompt detection of significant trends and learnings and (2) prevention of recurring incidents.

### **5.3 Records**

#### **5.3.1 Management Records/ Information management**

Information to verify the application and effectiveness of the ENSMS shall be collated from data collected as a result of:

- Application of the Work Management Process or Project Management Methodology
- Reviews and Audits (1st, 2nd and 3rd party)
- Network Safety Incident Investigations
- Routine Network Safety Performance Objective Reporting

Records shall be retained in compliance with the Horizon Power Record Keeping Plan<sup>20</sup> and Records / Document Management Information and Procedures Manual<sup>21</sup>.

Standard Work Packages detail the required documentation when works are undertaken by Regions using the Work Management Process.

The Guideline "Operations Requirements to Add Assets" (DM#[1553347](#)) details the documentation required when works are undertaken using Project Management Methodology or any other mechanism where Network Assets are handed over to Regions.

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<sup>19</sup> Horizon Power Record Keeping Plan - DM#[5241581](#)

<sup>20</sup> Horizon Power Record Keeping Plan - DM#[5241581](#)

<sup>21</sup> Records / Document Management Information and Procedures Manual- DM#[1869023](#)



Key record keeping systems include;

- DM – Horizon Power’s Document Management System
- Cintellate – Horizon Power’s Health and Safety Incident Reporting and Action Tracking system. It is intended to also use Cintellate to record and track actions arising from ENSMS Compliance Monitoring Reviews and Audits.
- Ellipse – Horizon Power’s primary Enterprise Resource Planning (ERP) system, which is used for all accounting, procurement and contracting functions. Ellipse’s Maintenance Management module is used by Horizon Power to store all primary Asset Management Records and Data.

#### **5.4 Audit**

Section 4.5.4 of the AS 5577:2013 requires Horizon Power to establish procedures for planning and implementing audits to determine compliance with, and effectiveness of, the ENSMS’s plans and procedures.

Horizon Power Risk & Audit function shall conduct the ENSMS audit program as described in the ENSMS Compliance and Audit Guide<sup>22</sup>. The guide describes the purpose of audits, the development of the audit plan, the audit process (including the management review of audit outcomes), and the detailed audit activities.

The results of the review shall be utilised as an input to future ENSMS objectives and initiatives.

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<sup>22</sup> ENSMS Compliance and Audit Guide - DM#[5195941](#)

## 6. MANAGEMENT REVIEW AND CHANGE MANAGEMENT

### 6.1 Management Review

The Electrical (Network) Safety Regulations 2015 and the incorporated AS 5577 standard require Horizon Power to have a management structure and procedures for the regular review of the effectiveness and appropriateness of the ENSMS. Horizon Power has established the ENSMS Management Working group to manage the ongoing monitoring, reporting, review and improvement of the Horizon Power ENSMS in a coordinated fashion. The Terms of Reference<sup>23</sup> governs how the ENSMS Management Working Group operates. The primary role of the ENSMS Management Working Group is to review the ENSMS to ensure its continuing suitability, adequacy, effectiveness and alignment with the strategic direction of the organisation.

The ENSMS Management Working Group supports the ENSMS Sponsor in the management and continuous improvement of the ENSMS by providing a decision-making framework that is logical, robust and appropriate.

The Management Working Group is designed to ensure the success and ongoing effectiveness and appropriateness of the ENSMS. Balanced and appropriate Regional and Functional contribution to the ENSMS Working Group is considered key to its success. The AS 5577 standard requires that the ENSMS shall be reviewed and revised as necessary, and at a minimum, no later than five years from the date of the last revision. The ENSMS Management Working Group will facilitate such reviews and is the recommending body for all revisions of the ENSMS. The Head of Power Systems in turn authorises such revisions. Monitoring and evaluation of the performance of the ENSMS shall be undertaken by the ENSMS Management Working Group on a bi-annual basis.

Suggested items to consider when monitoring and evaluating the performance of the ENSMS could include, but not limited to, the following:

- ENSMS Self-Assessment and Internal Audit findings;
- Network Safety Incident related data and review of associated corrective and preventative actions;
- Asset Safety Risk trends;
- Identified Operational issues;
- Identified ENSMS (system) issues;
- Changes to Supporting Systems and Procedures (Asset Management System, H&S System, etc);
- Changes to Legislation and Regulations; and
- Changes to Customer expectations.

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<sup>23</sup> ENSMS Working Group Terms of Reference – DM#[5339602](#)

## **6.2 ENSMS Management Structure**

### **6.2.1 Permanent Change of the ENSMS/Continuous Improvement**

As detailed in 6.1 above the ENSMS Management Working Group oversees the continuous improvement of the ENSMS and recommends for authorisation by the Head of Power Systems all changes to its overall structure as detailed in this Guide. Supporting Systems and Procedures (Asset Management System, H&S System, etc) can be changed by the appropriate Level 3 leader in line with their Corporate accountability.

To support continuous improvement a feedback process is in place and can be accessed by any employee or embedded contactor via the ENSMS Powerlink Page (<https://horizonpower.sharepoint.com/sites/Powerlink/safety/ensms/Pages/Feedback-and-FAQ.aspx> ).

Note: Changes to Supporting Systems (Asset Management System, H&S Management System, PMM, Risk Management System) or facilitated by these Systems (eg expansion of the Network) are managed via these Systems. In particular all asset delivery projects undergo risk assessment in accordance with the PMM and Risk Framework which are aligned with the ENSMS.

### **6.2.2 Temporary Change Management - Deviation process**

Deviations from the ENSMS must be authorized by the Level 3 leader with overall responsibility for the operating unit in which the deviation is proposed in consultation with the ENSMS Management Working Group Chairman. Deviations must be documented, and documentation must include the relevant factors supporting the deviation decision. Deviation authorization must be renewed periodically and no less frequently than every three years.

Emergency deviations, if required, must be authorized by the responsible Level 3 leader with overall responsibility for the operating unit in which the deviation is proposed when, as a result of an unforeseen event or situation, there is inadequate time to process a formal deviation. Emergency deviations shall be authorized only where it is not feasible to comply with a requirement of the ENSMS and must be brought to the attention of the ENSMS Working Group at the next scheduled meeting.

Emergency deviations shall be short in duration, not to exceed the time to perform the task at hand. The deviation must be documented. The documentation must include the relevant factors supporting the deviation decision and the interim measures to be put in place to achieve acceptable levels of electricity network safety.

## **6.3 Contact**

The contact for this document and the ENSMS is the Manager Asset Services, who is the nominated role responsible for the management of the ENSMS.

## 7. REFERENCES

### LEGAL REFERENCES:

Electricity (Network Safety) Regulations 2015

Electricity Corporations Act 2005

State Records Act 2000

### STANDARDS & GUIDELINES:

AS5577-2013 "Electricity Network Safety Management Systems" Standard

### RELATED POLICIES AND OTHER DOCUMENTS:

Safety and Health Policy  
Document Number: OSH-1-1-01 rev 1  
#4048166

Horizon Power Record Keeping Plan  
#5241581

Records / Document Management Information and Procedures Manual  
#1869023

ENSMS Management Review Procedure  
#5214959

Risk Management Policy  
#2760082

HP Corporate Risk Framework  
#2760190

Corporate Risk Matrix  
#1522391

Asset Management Policy  
#1548891

Horizon Power Asset Management Strategy and System  
#2772490

Asset Management Risk Framework  
#2671182

Asset Risk Tool Justification of Asset Risk Cost  
#4096732

Formal Safety Assessment Procedure  
#4921337

Design Guided Assessment Template  
#5052783

Procedure Guided Assessment Template  
#5168356

Corporate Risk Matrix  
#1522391

FSA Frequency Matrix  
#5157081

AIS Fact Sheet  
#5168849

AIS Output Process  
#5206929

Asset Risk Committee Terms of Reference  
#5030077

Asset and Project Risk Process  
#4918378

Asset Risk Committee Flow Diagrams  
#5203557

Underground Design Schemes Manual  
Standard Number: HPC-5DA-07-0012-2015

Developers Authorisation Form  
Standard Number: HP\_3\_17434-140416

Horizon Power's Asset Management Strategy and System  
#2772490

Safety and Health Management System Manual  
#2792747

Networks Permit to Work Standard  
#2495220

ENSMS Competency and Training Guide  
#5382011

Stakeholder Management Policy  
#3063887

Stakeholder Management Framework  
#3426314

ENSMS Compliance and Audit Guide  
#5195941

Incident Investigation Procedure  
OSH-4.2-1-02  
#2838057

Investigation Report Template OSH-4.2-4-1  
#2895816

Horizon Power Record Keeping Plan  
#3025398

Horizon Power Project Management Methodology  
#3323265

Standard Work Packages  
#5062969

Guideline: Operations Requirements to Add Assets  
#1553347

ENSMS Continuous Improvement Suggestion Management  
#10931391

Corrective Action Effectiveness Register  
#17683969

Emergency Procedure Severe Storm, Cyclone, Flood and Bushfire Response  
#14289345

## 8. APPENDICES

### APPENDIX 1. EXTERNAL STANDARDS AND CODES

Standards body	Number	Title	Topic
AS/NZS	1429.1	Electric Cables – Polymeric Insulated	Cables
AS/NZS	4961	Electric cables - Polymeric insulated – for Distribution and service applications	Cables
AS/NZS	4026	Electric Cables – For underground residential distribution systems	Cables
AS/NZS	5000	Electric cables – Polymeric insulated – for Working voltages up to and including 0.6/1(1.2) kV	Cables
AS/NZS	3013	Electrical installations - Classification of the fire and mechanical performance of wiring system elements	Cables
ENA	EG0	Power System Earthing Guide –Part 1 – Management Principles	Earthing
ENA	EG1	Substation Earthing Guide	Earthing
AS/NZS	3835	Earth potential rise—Protection of telecommunications network users, personnel and plant	Earthing
AS	60529	Degrees of protection provided by enclosures (IP Code)	Equipment
AS	62271	High-voltage switchgear and control gear	HV switchgear
AS	60044	Instrument Transformers	HV switchgear
IEEE	386	Separable Insulated Connector Systems for Power Distribution Systems above 600 V	HV switchgear
IEC	60282	High voltage fuses	HV switchgear
AS	2467	Maintenance of electrical switchgear	HV switchgear
AS/NZS	4853	Electrical Hazards on Metallic Pipelines	Inductive and capacitive hazards
IEC	60071	Insulation coordination	Insulation
AS	4435.1	Insulators – Composite for overhead power lines – Voltages greater than 1000 V a.c.	Insulators
AS	2947	Insulators - Porcelain and glass for overhead power lines - Voltages greater than 1000 V a.c.	Insulators
AS	4899	Pin insulators - Porcelain and glass for overhead power lines - Voltages greater than 1000 V a.c.	Insulators
AS	4436	Guide for the selection of insulators in respect of polluted conditions	Insulators
AS	3608	Insulators Porcelain and glass, pin and shackle type – Voltages not exceeding 1000 V a.c	Insulators
AS	62217	Polymeric insulators for indoor and outdoor use with a nominal voltage > 1000 V - General definitions, test methods and acceptance criteria	Insulators

Standards body	Number	Title	Topic
IEC	60720	Characteristics of line post insulators	Insulators
AS/NZS	4777	Grid Connection of Energy Systems via Inverters	Inverters
AS/NZS	1158	Lighting for roads and public spaces	Lighting
AS	1768	Lightning protection	Lightning protection
AS/NZS	60598	Luminaires - General requirements and tests	Luminaires
IEC	60269	Low-voltage fuses	LV fuses
ENA	Doc 014	National LV Electricity Network Electrical Protection Guideline	LV protection
AS	4741	Testing of connections to low voltage electricity networks	LV protection
AS/NZS	3000	Wiring Rules	LV protection
AS/NZS	60947	Low-voltage switchgear and control gear	LV switchgear
AS/NZS	61439	Low-voltage switchgear and control gear assemblies	LV switchgear
AS/NZS	4836	Safe working on or near low-voltage electrical installations and equipment	LV work
AS	1940	The storage and handling of flammable and combustible liquids	Oil
AS	1767	Insulating oil for transformers and switchgear	Oil
AS	1883	Guide to maintenance and supervision of insulating oils in service	Oil
AS	1222	Steel conductors and stays – Bare overhead	Overhead conductor
AS	1746	Conductors - Bare Overhead - Hard Drawn Copper	Overhead conductor
AS	3607	Conductors — Bare Overhead, aluminium and aluminium alloy — Steel	Overhead conductor
AS	1531	Conductors - Bare overhead -- Aluminium and aluminium alloy	Overhead conductor
AS/NZS	7000	Overhead line design - detailed procedures	Overhead lines
AS/NZS	5033	Installation of Photovoltaic Arrays	Photovoltaic panels
AS	1798	Lighting poles and bracket arms—Recommended dimensions	Poles
AS/NZS	4676	Structural design requirements for utility services poles	Poles
AS/NZS	4677	Steel utility services poles	Poles
AS	61000.3.100	Electromagnetic compatibility (EMC) Part 3.100: Limits—Steady state voltage limits in public electricity systems	Power quality
AS/NZS	61000.3.6	Electromagnetic compatibility (EMC) Part 3.6: Limits—Assessment of emission limits for distorting loads in MV and HV power systems	Power quality
AS/NZS	61000.3.7	Electromagnetic compatibility (EMC) Part 3.6: Limits—Assessment of emission limits for fluctuating loads in MV and HV power systems	Power quality



Standards body	Number	Title	Topic
ISO	31000	Risk management – Principles and guidelines	Risk
AS	5577	Electricity network safety management systems	Risk
AS/NZS	60479	Effects of current on human beings and livestock	Safety
IEEE	1366	Guide for Electric Power Distribution Reliability Indices	SAIDI/CAIDI etc.
IEC	60909	Short-circuit currents in three-phase a.c. systems	Short circuit calculation
AS/NZS	1170	Structural Design Actions	Structural
AS	2067	Substations and High Voltage Installations exceeding 1 kV a.c.	Substations
AS	60076	Power transformers	Transformers
AS	2374	Power transformers	Transformers
AS	2558	Transformers for Use on Single Wire Earth Return Distribution Systems	Transformers
AS	4799	Installation of Underground Utility Services and Pipelines within Railway Boundaries	U/G services
AS	6947	Crossing of Waterways by Electricity Infrastructure	U/G services
AS	60038	Standard voltages	Voltage
AS	5577	Electricity Network Safety Management Systems	Network Safety