

Supporting Document 12.1.5

Network Strategy

**Safety & Environment –
OM8018.16 2019-2024**

April 2018



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1 Executive Summary

Network Strategy	Network Safety and Environment Strategy 2019-2024; OM8018.16
Description	<p>This document sets out Essential Energy's Network Safety and Environment Strategy, which is part of the Asset Management System.</p> <p>It directs our Safety and Environment processes, projects, and programs so we can achieve our Asset Management Objectives.</p>
Objectives	<ul style="list-style-type: none">• To set out strategies that Essential Energy will use to achieve its network safety and environmental objectives in line with corporate requirements.• To break down the Asset Management Objectives — as directed by the overarching Strategic Asset Management Plan (SAMP) — into more specific Asset System and Class Objectives and targets to use in the Asset Management Plans and Investment Cases.
Approach	<p>As per the SAMP, this Network Strategy expands on the assigned Asset Management Objectives through the lens of safety.</p> <p>Using the assigned Asset Management Objectives, it reports on a gap analysis and identifies any emerging issues (outside routine asset lifecycle practices) that must be explored in our Investment Cases.</p> <p>This Strategy is the basis for a Performance Monitoring Plan that will ensure it achieves the Asset Management Objectives.</p>
Customer Benefits	<p>Provision of an electricity supply that meets requirements for safety and that minimises harm to the environment, so far as is reasonably practicable. Meets our compliance obligations, while also addressing customer expectations, as expressed through Essential Energy's customer engagement studies.</p>
Implementation timing	2018/19–2023/24

2 Introduction

This document sets out Essential Energy's Network Safety and Environment Strategy for asset management.

It provides direction across all our asset management planning and activities to ensure the network achieves its safety and environment objectives, including compliance with the relevant Acts and Regulations.

It also draws on the experience and insight we have gained through our customer engagement.

2.1 Purpose

This Strategy is part of our Asset Management System (AMS) and is a direct output of the Strategic Asset Management Plan (SAMP). It also guides, and feeds into, all Essential Energy's Investment Cases.

Its purpose is to set out the strategies that we will use to manage the asset-related safety and environmental performance of Essential Energy's distribution network. We have developed these strategies to guide decision-making within a framework of corporate risk tolerance and legislative and regulatory requirements.

2.2 Scope

The scope of this strategy covers the asset-related safety and environment performance of the network. This includes worker and public safety incidents and environmental incidents attributed to network assets.

The strategy covers the measurement, monitoring, maintenance and improvement of asset safety and environmental performance.

It addresses all stages of the electricity asset lifecycle, including: planning, design, procurement, construction, commissioning, operation, maintenance and ultimately de-commissioning and disposal or recycling.

It complements existing operational procedures that form Essential Energy's Electrical Network Safety Management System (ENSMS).

2.3 Regulatory Context

Our main compliance obligations regarding network safety are contained in these Acts and Regulations:

- > *Work Health and Safety Act 2011.*
- > *Work Health and Safety Regulation 2011 (NSW).*
- > *Electricity Supply Act 1995.*
- > *Electricity Supply (Safety and Network Management) Regulation 2014 (NSW.)*
- > *National Electricity Rules (NER).*

As Essential Energy owns and operates an electricity network across a franchise area in Queensland, we must also comply with these legislative requirements:

- > *Work Health and Safety Regulation 2011 (QLD).*
- > *Electrical Safety Act 2002.*
- > *Electrical Safety Regulation 2013.*

For environmental compliance, the following legislation are relevant:

- > *Protection of the Environment Operations Act 1997 (POEO Act).*
- > *Environmentally Hazardous Chemicals Act 1985.*
- > *Environmental Planning and Assessment Act 1979.*
- > *National Parks and Wildlife Act 1974.*
- > *Biodiversity Conservation Act 2016.*
- > *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*

There is a full list of the relevant Acts and Regulations in Essential Energy's *Legislative Register* CEOP4304.11. They all support the operation of a safe and reliable electricity network. Collectively, they impose several requirements on Essential Energy.

- > The safety of people working on the network, our staff, Accredited Service Providers (ASPs) and contractors.¹
- > The safety of members of the public.¹
- > The protection of property, whether it belongs to Essential Energy or not.¹
- > The management of safety risks arising from protecting the environment e.g. preventing bushfires.¹
- > The management of safety risks arising from the loss of supply.
- > Compliance with the *Code of Practice - Electricity Transmission and Distribution Asset Management 2009*.²
- > Risk-assessed and compliant navigable water crossings — *Navigable Waters: Electricity Industry Code 2008* and *Australian Standard AS 6947-2009 Crossing of Waterways by Electricity Infrastructure*.²
- > Management of oils containing polychlorinated biphenyl compounds (PCBs) — *Polychlorinated Biphenyl (PCB) Chemical Control Order 1997*.³

2.4 Information Sources

When developing this Strategy, we used information from these sources:

- > Acts and Regulations specified in Section 2.3
- > Industry Codes and Guidelines such as those produced by the Electricity Networks Australia (ENA) Industry Safety Steering Committee (ISSC).
- > Australian Standards e.g. AS/NZS 7000 2016, AS 5577-2013.
- > NSW Service and Installation Rules and their Queensland equivalent.
- > Independent Pricing and Regulatory Tribunal (IPART) *Reporting Manual* and *Audit Guidelines*.
- > Essential Energy TotalSAFE data
- > Essential Energy asset performance data
- > Essential Energy Public Safety, Worker Safety, Environment and Loss of Supply Formal Safety Assessments (FSAs)

¹ Electricity Supply (Safety and Network Management) Regulation 2014 -Part 2 clause 6.

² Directed by the Director General through Electricity Supply (Safety and Network Management) Regulation 2008.

³ Directed by the Environment Protection Agency (EPA) under Protection of the Environment Operations Act 1997 (POEO Act).

3 Background

This section provides an overview of Essential Energy's current position, which forms the basis of our strategies for this period. It also presents emerging issues that we considered when developing our strategies for 2019-2024.

3.1 Recent & Ongoing Developments

This section provides an overview of the main safety and environmental improvements and ongoing initiatives resulting from recent business transformation.

3.1.1 Customer Engagement

We have engaged with customers through a range of channels, including customer focus groups and customer forums. Their expectations are summarised in Section 4.3.

Essential Energy has also established a Customer Advisory Group (CAG). This includes representatives from various community groups, including disadvantaged, rural and business customers. The group is available for consultation on various matters, including safety and environmental strategies.

We have engaged Woolcott Research & Engagement to conduct the latest customer forums.

3.1.2 Asset Data

We have:

- implemented the use of Light Detection and Ranging (**LiDAR**) technology to improve the targeting of our vegetation clearing in the management of bushfire risk
- begun trialling the use of remotely piloted **drones** for fault finding and network asset condition inspections.
- Introduced new **mobile data capture** technology for field crews, to provide quicker access to asset information
- Begun investigating new **asset health monitoring** technology, including for fire detection and fault anticipation

Essential Energy is also reviewing its **Enterprise Asset Management** system to improve data accuracy and decision asset management making.

3.1.3 QA Lab

In late 2013 part of Essential Energy's asset management team instigated a project to look at improving the quality and performance of materials utilised on the network coupled with a desire to reduce costs. This project resulted in a whole of business change in the way materials quality was managed with processes implemented covering the acquisition, receipting, and auditing of materials used on the network. Instrumental in shaping the policies and practices was the development of a materials testing laboratory (QA lab) that performs standards based tests as well as accelerated aging tests. This initiative has directly reduced costs, improved safety outcomes and shaped investment decisions within Essential Energy across the whole asset lifecycle.

3.1.4 Improvements to TotalSAFE

We have updated TotalSAFE, Essential Energy's environmental and safety incident database, so that from July 2015 onwards, it captured more information about incidents related to asset management. Additional fields report whether an incident:

- Was a near-miss or hazard.
- Caused injury or illness.
- Jeopardised public safety.
- Resulted in network asset damage or failure.
- Resulted in property damage.

- Resulted in fire.
- Resulted in environmental damage.

3.1.5 Asset Performance Analysis

We have developed our asset failure investigations and reporting capability, to provide improved insights into the performance of significant asset classes. A key focus to date has been on wood poles. This capability is now being expanded to overhead conductors, cross arms and other key distribution asset classes.

3.1.6 Risk Evaluation Packs

We have developed 'Risk Evaluation Packs', based on the data collected in TotalSAFE. These provide detailed analysis of the safety and environmental performance, to build an understanding of the risks, root causes, effectiveness of current controls and opportunities for improvement. To date, Risk Evaluation Packs have been developed for:

- Public Safety
- Environmental Risk
- Worker Safety (Network Fatal Risks and other non-HPI risks)
- Loss of Supply

3.1.7 Electricity Network Safety Management System & Formal Safety Assessments

Essential Energy has continued to improve its Electricity Network Safety Management System (ENSMS), taking on board findings from IPART audits and from Essential Energy's own internal audits.

In particular, significant efforts have been directed to improving the maturity of the suite of Formal Safety Assessments that underpin the ENSMS.

3.1.8 Safety Differently

In 2017-18, Essential Energy is working to implement its new Safety Differently strategic framework. This is expected to implement changes to the safety management system and practices, including stronger emphasis on leading indicators and empowerment to support achievement of Essential Energy's long-term safety objectives.

3.1.9 Safety & Environmental Risk Appetite

In 2017, Essential Energy refreshed its Corporate Risk Management Policy⁴. This establishes the corporate risk appetite for safety and environmental risk.

3.1.10 Asset Risk Management Procedure

Essential Energy has developed an Asset Risk Management Procedure⁵. This complements the Corporate Risk Management Procedure to:

- Provide additional granularity required to identify variations in risks between assets and programs
- Provide methodologies from which analysis of risk treatment options can be performed
- Provide additional granularity to identify the risk impact of any risk treatments
- Ensure consistent processes are used to identify, assess and communicate material asset related risks within Essential Energy

The Asset Risk Management Procedure sets out the approach to managing asset-related risk So Far As Is Reasonably Practicable (SFAIRP)

⁴ Risk Management - CECP0002.03 – Issue 6

⁵ Asset Risk Management – CEOP2111.01 – Issue 1

3.1.11 Value Framework

The Appraisal Value Framework⁶ has been developed to define the cost of consequence assumptions used to determine the asset risk value.

3.1.12 Bushfire Management

The Essential Energy Bushfire Risk Management Plan⁷ sets out the framework of strategies employed to reduce the likelihood of fire ignition as it relates to our assets and manage the risks associated with operating powerlines near vegetation.

Recent improvements to our bushfire risk management include:

- Improved relationships and information sharing with the NSW Rural Fire Service (RFS)
- Continued development and implementation of new fire risk modelling using the Pheonix Rapid Fire modelling system
- Continued involvement with related industry groups

3.1.13 Risk Based Optimisation Approach

We have developed our Risk Based Optimisation methodology⁸, to inform the implementation of more sophisticated risk management and optimised investment decision making.

This aligns to the Asset Risk Management Procedure and Appraisal Value Framework and describes the top down and bottom up approaches to building an optimised portfolio of asset investments, to meet the identified objectives within specified constraints such as expenditure limits and delivery capability.

3.1.14 Asset Investment Planning System

Essential Energy has invested significant resources into the development of an Asset Investment Planning System. This implements the risk based optimisation approach described in section 3.1.13.

3.1.15 Risk-Based Scheduling

We have begun work to develop a risk-based scheduling approach that will efficiently bundle work tasks together, thereby delivering improved risk reduction per dollar invested, potentially reducing the cost to achieve the stated safety and environmental performance objectives, or delivering improved performance for the same cost.

3.1.16 Infrastructure Programs

As well as the implementation of LiDAR technology (see Section 5.3.1), we have improved our contracting arrangements for completing vegetation management work.

3.1.17 Contaminated Land Management

We have been progressing our Contaminated Land Management program. Activities include site investigations, remediation works and monitoring.

3.1.18 Hazardous Substance Management

We have improved our processes and procedures for managing asbestos.

3.1.19 Public Electrical Safety Awareness

Reflecting the findings from the Public Safety Risk Evaluation Pack, the Public Electrical Safety Awareness Plan (PESAP) implements key initiatives and campaigns to raise electrical safety awareness amongst the general public and across key industry sectors.

⁶ Appraisal Value Framework – Issue 1

⁷ Bushfire Risk Management Plan – CEOP8022 – Issue 13

⁸ Risk Based Optimisation – Issue 1

The current PESAP has a targeted focus on four 'at risk' groups:

- Agribusiness
- Community
- Construction
- Emergency Services and life support customers

3.1.20 Research & Development

Recent research and development initiatives contributing to our safety and environmental objectives have included:

- Trialling an end-to-end Energy Management System, including solar panels, inverter system and storage options, to gain insights and skills needed to support customers' interest in this technology
- Trial of new micro-drilling and sensor technology for wood poles to provide better condition data to feed into wood pole management.

3.2 Emerging Influences

Key features of our current operating environment are:

- **Changing customer needs/demands/expectations:** demand for lower prices, alternative technologies, greater control of how electricity is consumed
- **New energy market:** network transformation, rapidly evolving technologies; increasing volumes of small and large scale renewable generation being connected to the network
- **Changing shareholder & regulator demands:** increasing efficiency pressures, shifting regulatory landscape, including changing requirements for reporting & auditing
- **Aging network:** many assets are reaching their end of life, meaning an increasing challenge to maintain current performance levels
- **Developments in information technology and contemporary safety science:** new ways of meeting our objectives

A further tension for this strategy is to demonstrate that safety risks are tolerable, while also being managed in a way that is prudent and efficient.

4 Performance Requirements

This section outlines the network safety and environmental performance requirements that result from:

- Essential Energy's Business Objectives and Asset Management Objectives
- Regulations set out in Section 2.3
- Findings from our customer engagement

4.1 Essential Energy's Business Objectives and Asset Management Objectives

Essential Energy's business objectives are:

- Continuous improvements in safety culture and performance;
- Operate at industry best practice for efficiency, delivering best value for customers;
- Deliver real reductions in customers' distribution network charges; and
- Deliver a satisfactory Return on Capital Employed.

These are implemented through the Asset Management Objectives as:

- Ensure risk is aligned with corporate risk tolerance
- Customers receive a quality of service that is in line with expectations
- Management of assets such that investment decisions result in sustainable, cost effective performance outcomes for the present and the future
- Comply with applicable statutory or regulatory obligations or requirements

Essential Energy's Corporate Risk Management Policy (CECP0002.03) states that Essential Energy has a 'very low' appetite for safety risk and a 'low' appetite for environment risk.

4.2 Regulatory Requirements

4.2.1 Work Health and Safety Act 2011

Work health and safety in NSW is controlled under a legislative regime that includes Acts, Regulations and Codes of Practice. The principal legislation is the *Work Health and Safety Act 2011*, which is supported by the *Work Health and Safety Regulations 2011*.

Under the Act, Essential Energy must eliminate and (failing that) reduce safety risks to those affected by our undertakings (including workers and members of the public) So Far As Is Reasonably Practical (SFAIRP). This requires consideration of the balance of the significance of the risk (i.e. the probability of occurrence and severity of harm) versus the effort required to reduce it in terms of expense, difficulty, inconvenience or other conflicting responsibilities.

4.2.2 Electricity Supply Act 1995

The *Electricity Supply Act 1995* provides the framework for promoting industry efficiency, generally through establishing a balance of competition and regulation. By standardising infrastructure design and service, customers benefit from increased:

- > Community safety.
- > Compatibility among electricity supply systems.
- > Economies of scale.
- > Freedom to exercise choice.

Essential Energy is also bound by the provisions of the *Electricity Supply (Safety and Network Management) Regulation 2014 (NSW)*, which requires a Safety Management System as per AS 5577:2013 (*Electrical Network Safety Management Systems*). This supports:

- > The safety of members of the public.
- > The safety of people working on networks.
- > The protection of property, whether it belongs to a Network Operator or not.
- > The management of safety risks arising from protecting the environment e.g. preventing bushfires that may be ignited by network assets.
- > The management of safety risks arising from loss of electricity supply.

AS 5577:2013 also references the risk management standard AS/NZS ISO 31000, which should be applied to ensure "all reasonable steps to ensure that the design, construction, commissioning, operations and decommissioning of its network (or any part of its network) is safe". To achieve a clear and consistent risk management approach between the *Electricity Supply Act 1995* and the associated 2014 Regulation, the requirements of AS 5577:2013 and the *Work Health and Safety Act 2011*, Essential Energy has adopted the SFAIRP approach.

We are also required to adopt the *Code of Practice – Electricity Transmission and Distribution Asset Management 2009* — as directed by the Director General NSW Department of Water and Energy by letter in 2010 — under the *Electricity (Safety and Network Management) Regulation 2008*.

Although the *Electricity (Safety and Network Management) Regulation 2008* has been repealed, the new 2014 Regulation specifies "that any Act, matter or thing that, immediately before the repeal of the *Electricity Supply*

(*Safety and Network Management*) Regulation 2008, had effect under that Regulation continues to have effect under this Regulation". Therefore, the Code of Practice still applies.

The Code of Practice aims to provide guidance as to cost-effective practices and procedures that protect the interests of customers and public, particularly in relation to safety. The Code outlines the policy and standards that apply to the design, construction, maintenance and operation of electricity works and provides for high standards in relation to the safety and integrity of the network.

The Code also establishes that recognised good practice is accepted as the baseline for setting precautions and controls, as codified in international and Australian standards, industry codes and guidelines.

Although the Code of Practice may not make a standard legally binding, it does establish a baseline for the risk acceptable to the industry. As such, when we need to depart from a standard (e.g. due to financial inefficiencies), we are able to implement a risk-based alternative that delivers an equal or better risk outcome for our network compared to other utilities and industries to which the Code applies.

4.2.3 Bushfires

Bushfire is a major challenge for the community, and Essential Energy has an important role to play in ensuring our assets do not contribute to developing or spreading them. Our ENSMS requires a Bushfire Management Plan (CEOP8022), which is part of the AMS. *Electricity Supply (Safety and Network Management) Regulation 2014* (NSW) has a strong focus on bushfire management.

Some external documents also drive bushfire safety, including *Planning for Bushfire Protection (PBP) 2006*. This was developed by the NSW Rural Fire Service to enable the NSW Government to work jointly with local government and the public and private sectors to link responsible planning and development control with the protection of life, property and the environment.

In addition, the *Code of Practice – Electricity Transmission and Distribution Asset Management 2009* identifies a guide to tree planting and maintaining safety clearances near power lines: *ISSC3 (Guide for the Management of Vegetation in the Vicinity of Electricity Assets)*⁹.

Essential Energy's design and construction standards also consider the requirement for electricity assets to survive a bushfire, recognising that maintaining supply during bushfires is important for firefighting efforts (e.g. water pumping) and emergency communications.

4.2.4 Navigable Waterways

The *NSW Maritime Crossings of NSW Navigable Waters: Electricity Industry Code* was introduced in 2008 by the Director General, NSW Department of Water and Energy under the *Electricity Supply (Safety and Network Management) Regulation 2008* to replace the previous *Licensing of Crossings* by NSW Maritime. As mentioned in Section 4.2.2, any direction given by the Director General under the 2008 Act still applies.

In addition to the above Electricity Industry Code, the *Australian Standard AS 6947 Crossing of waterways by electricity infrastructure 2009* was subsequently developed and published to mitigate against the associated navigation safety issues.

Electricity cables and conductors which cross navigable waters can pose a hazard to water craft and other activities along waterways (e.g. aircraft operations). The most significant potential hazards are live overhead electricity crossings.

Boat masts, crane jibs, aircraft and other equipment or vessels may touch the overhead electricity conductors and anchors may become entangled with submarine cables. Such events may cause damage to the vessel, serious injury to its occupants and even death. Other consequences include damage to the electricity infrastructure and loss of supply, environmental impacts, and legal and financial liabilities.

4.2.5 National Electricity Rules (NER)

The National Electricity Rules (Chapter 6) establish a requirement for Essential Energy to forecast operating and capital expenditure in order to 'maintain the safety of the system' through the supply of standard control services.

⁹ This guide was revised in 2016, although reference was made to the previous guide.

4.2.6 Pollution of waters

The *Protection of the Environment Operations Act 1997 (POEO Act)* contains general requirements for the prohibition of the pollution of waters.

The *National Water Quality Management Strategy (NWQMS)* provides a framework for action and a series of guidelines and scientific criteria that help improve water quality. As part of its participation in the NWQMS, the NSW Government has established processes to coordinate water quality management programs across all State Government agencies. The management and disposal of potentially contaminated run-off is detailed in Essential Energy's *Safety, Security, Health and Environmental Manual: Water* (CECM1000.73).

Under the POEO Act, we are required to ensure that we do not permit contaminated water, oil or chemical spills to pollute water catchments. Essential Energy has potential contaminants within certain assets and we use potential contaminants — such as fuel, solvents and lubricants — when constructing and maintaining assets.

New and upgraded substation are designed in accordance with AS1940 relating to the bunding and storage of oil filled equipment.

4.2.7 Noise Pollution

In NSW, noise pollution is regulated through the POEO Act. The POEO Act makes the Environment Protection Authority (EPA) the authority responsible for regulating noise from activities scheduled under the Act and from premises occupied by public authorities.

To support the POEO Act, the *NSW Noise Policy for Industry* was released on October 2017, following widespread public consultation on the draft policy.

The policy provides guidance on noise trigger levels and a process for determining feasible and reasonable mitigation measures. Essential Energy investigates all community complaints on substation noise and applies the noise policy in determining appropriate actions to be taken.

4.2.8 Polychlorinated Biphenyl Compounds

Various electrical assets are oil-filled (e.g. transformers) or oil-impregnated (e.g. capacitors). Historically, some oils contained polychlorinated biphenyl compounds (PCBs) for their insulation thermal transfer capabilities. PCBs are a class of highly persistent, bio-accumulative chemicals covered by the international environmental treaty, the *Stockholm Convention on Persistent Organic Pollutants*.

The NSW Government enacted the *Environmentally Hazardous Chemicals Act 1985*, which sets up the Hazardous Chemicals Advisory Committee. The Committee's functions include advising the EPA in relation to the assessment and control of chemicals that are environmentally hazardous. The EPA may declare substances to be chemical wastes for the purposes of the Act.

The EPA can make Chemical Control Orders (CCOs) with respect to assessed chemicals or declared chemical waste. The CCOs give legal force to the regulation of activities such as the manufacture, processing, conveying, buying, selling or disposal of the chemical or declared wastes.

Chemicals for which a CCO has been made are referred to as environmentally hazardous chemicals. A CCO may prohibit activities in relation to environmentally hazardous chemicals or declared chemical wastes, unless they are licensed by the EPA.

Essential Energy is in the process of removing PCBs from zone substation transformers. Under the National PCB Management Plan, we dispose of equipment that has non-scheduled¹⁰ PCB levels by approved methods at its end of life. However, given the age and condition of many zone substation assets containing PCBs, these are subject to additional planned replacement programs.

We operate our distribution substations until they break down (run to failure) then, depending on their waste classification, test and dispose of the assets.

The CCO also requires Essential Energy to maintain a register of sites containing PCBs; undertake a risk management program to ensure all sites are PCB-free; and develop emergency management arrangements in the interim.

¹⁰ Non-Scheduled PCB levels are defined as levels greater than 50 ppm

Essential Energy's *Safety, Security, Health and Environmental Manual: Hazardous Materials* (CECM1000.10) satisfies these requirements.

4.2.9 Asbestos

Under the *Work Health and Safety Regulation (NSW) 2011*, a worker must not carry out any work that involves asbestos. The transport and disposal of asbestos is controlled under the POEO Act.

Essential Energy has adopted training for asbestos identification, treatment and disposal within our annual employee safety testing. We remove any asbestos that will be disturbed during work, where reasonably practical, using the procedures directed by WorkCover NSW and keep an asbestos register that is updated by the Asbestos Working Group.

4.2.10 Sulphur Hexafluoride Gas

Sulphur hexafluoride (SF₆) is a gas used in insulated switchgear and circuit breakers to prevent arcing. It is a synthetic greenhouse gas and its use is monitored under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act).

There are no issues with SF₆ within a controlled environment but there are consequences when it is emitted, which may occur with asset leakage, maintenance or decommission. Along with the environmental consequence of the greenhouse gas release, there is a safety risk under the *Work Health and Safety Act 2011* as the gas may settle in a confined space. The gas has a greater density than air, so small leakages would not result in any health issues as it would stay at ground level. However, with a large leakage, the SF₆ would displace the air in a room, suffocating anyone present. Furthermore, SF₆ can create a highly corrosive environment when the by-products are under-arc-ing and moisture is present.

4.3 Findings from Customer Engagement

We have engaged with our customers through a range of channels, including customer focus groups and customer forums, to understand their expectations for how we manage safety and environmental performance.

Figure 1 shows the key findings from this engagement:

	Theme	What you said
<p>Safety of customers and staff was viewed as a 'given' and seen as essential.</p>	 Affordability	You believe that electricity should be affordable for all customers and expect your electricity network to provide value for money. You would like us to deliver services with no or minimal price increases.
	 Reliability	You told us you were satisfied with your power reliability and understand that there will be unplanned outages, however you want us to continue to maintain the electricity network to prevent power issues in the future. You would consider a small reduction in power reliability for a reduction in your electricity bill.
	 Good customer service and communication	You want us to use a variety of ways to communicate with you with early notice of a planned outage and relevant information provided during an unplanned outage. You would like quick turnaround when we respond to your enquiries.
	 Transparency/bill itemisation	You want more transparency in how the costs on your bill are made up and where these costs come from.
	 Environmentally friendly/Encouraging renewables	You want us to investigate renewable energy opportunities and support their use on the electricity network. You also want us to continue caring for the environment and minimising our impact on it.
	 Innovative technologies	You are interested in new technologies and support us undertaking research and development.

Figure 1 - Key Findings from Customer Engagement

4.4 Summary of Performance Requirements

This section summarises the consolidated safety and environment objectives, derived from the various objectives and obligations set out in sections 4.1 to 4.3.

4.4.1 Safety

For the purpose of this strategy development, the consolidated safety objectives are:

- Meet our obligation to manage safety risk SFAIRP
- At least maintain current network safety performance levels

4.4.2 Environmental

For the purpose of this strategy development, the consolidated safety objectives are:

- Meet our general environmental duty, not to carry out an activity that may cause harm without taking measures to prevent or minimise the harm
- Meet our general duty to notify of environmental harm - to inform the relevant authority and landowners when environmental harm has occurred, or might occur
- Compliance with specific obligations around environmental protection, including pollution of waters, noise pollution, PCBs or other environmentally hazardous chemicals, asbestos, SF6
- Investigate renewable energy opportunities and support their use on the network

4.5 Summary of Performance Measures

Table 1 summarises the current safety and environmental performance measures and the associated Asset Management Plans (AMPs).

Table 1 – Summary of current performance measures

Requirement Source	Measure	Applicable AMPs				
		OHN	UGN	ZS	Sec. Sys*	Pub. Light
<i>Work Health and Safety Act 2011</i> <i>Electricity Supply (Safety and Network Management) Regulations 2014</i> <i>National Electricity Rules</i> <i>Customer Expectations</i>	Number of Fatal/Serious Worker injuries attributed to assets in TotalSAFE per FY Number of Worker HPis attributed to assets in TotalSAFE per FY Number of Public IPART Cat 1 incidents attributed to assets in TotalSAFE per FY Number of Public IPART Cat 2 incidents attributed to assets in TotalSAFE per FY Number of Public IPART Cat 3 incidents attributed to assets in TotalSAFE per FY	X	X	X	X	X
<i>Planning for Bushfire Protection 2006</i> <i>Customer Expectations</i>	Number of fire starts caused by assets per FY	X	X	X	X	X
<i>NSW Maritime Crossings of NSW Navigable Waters: Electricity Industry Code 2009</i> <i>Customer Expectations</i>	Number of non-conforming sites	X				
<i>Protection of the Environment Operations Act 1997 – Pollution of waters</i> <i>Customer Expectations</i>	Number of reportable water pollution incidents attributed to assets in TotalSAFE	X	X	X		
<i>Protection of the Environment Operations Act 1997 – Noise Pollution</i> <i>Customer Expectations</i>	Number of complaints relating to assets exceeding noise trigger levels per financial year			X		
<i>PCB Chemical Control Order 1997</i> <i>Customer Expectations</i>	Number of polychlorinated biphenyl licence breaches	X	X	X		
<i>Work Health and Safety Act 2011</i> <i>Protection of the Environment Operations Act 1997</i> <i>Customer Expectations</i>	Number of non-conformances related to identification, management and removal of asbestos-containing material	X	X	X		
<i>Work Health and Safety Act 2011</i> <i>National Greenhouse and Energy Reporting Act 2007</i> <i>Customer Expectations</i>	Number of SF6 leakage incidents recorded in TotalSAFE	X		X		

OHN – Overhead Network UGN – Underground Network ZS – Zone Substations Sec. Sys - Secondary Systems Pub. Light – Public Lighting

*Secondary systems include SCADA, telecommunication, generation, network metering and load control

5 Performance and Gap Analysis

This section discusses the performance of Essential Energy's network against the requirements set out in Section 4.4. It identifies the main contributors to the current performance and any known opportunities for improvement.

5.1 Safety

This section sets out the current network level safety performance. This is based on relevant FY16, FY17 and year to date (YTD) FY18 data, as recorded in TotalSafe.

Worker data is presented in terms of numbers of fatal/serious injuries and numbers of high potential incidents (HPIs) attributed to network assets. Figures 2 and 3 respectively show the data, broken down by AMPs. FY18 data has been calculated pro rata, based on available data to January 2018.

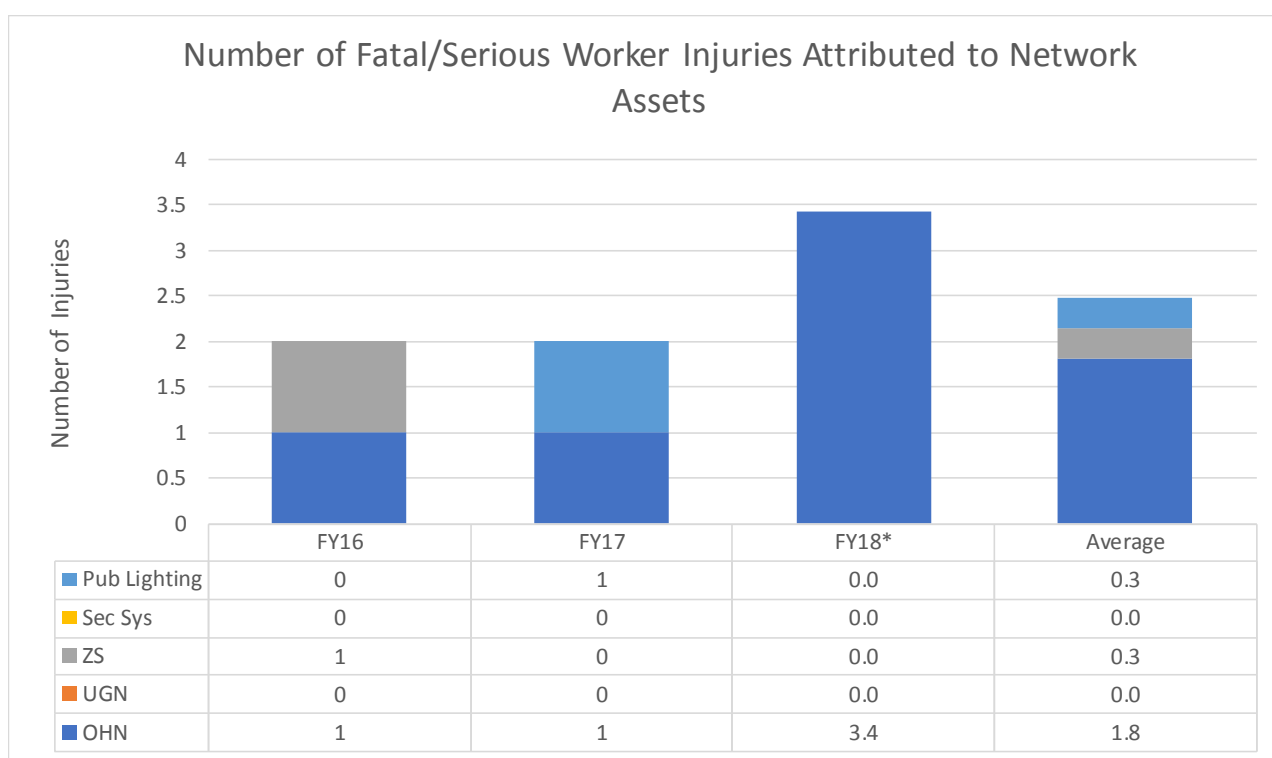


Figure 2 - Number of Worker Fatal/Serious Injuries Attributed to Network Assets

(* Data calculated pro rata)

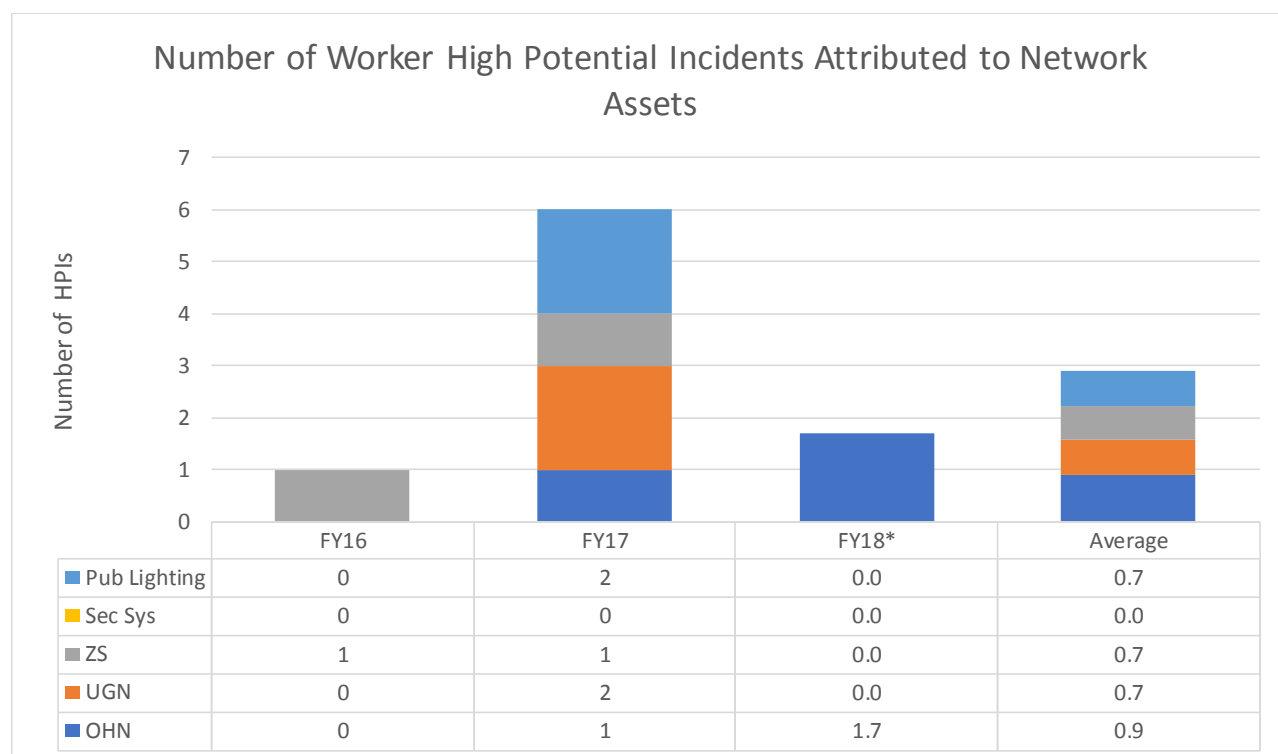


Figure 3 – Number of Worker High Potential Incidents Attributed to Network Assets

(* Data calculated pro rata)

Key conclusions from this data are that:

- The overhead network is the main contributor to the current number of fatal/serious worker injuries attributed to network assets. This needs to be considered in the context of the relative volumes of work and therefore the levels of exposure of workers to this category of network assets.
- Worker HPIs are more widely distributed across the different categories of network assets. If taken as a leading indicator, this indicates the need to remain focussed on the potential for fatal/serious incidents across all asset classes.

Public safety data is presented against IPART incident reporting categories. These were introduced in October 2016. To provide meaningful comparisons from part-year data, a 12 month figure has been calculated as a pro rata for each year, using the available data from October 2016 to June 2017 (for FY17) and July 2017 to Jan 2018 (for FY18).

Since October 2016 there have been no IPART Category 1¹¹ incidents involving members of the public that were attributed to network assets.

Figures 4 and 5 respectively show IPART reportable Category 2¹² and 3¹³ incidents involving members of the public and attributed to network assets.

-
- ¹¹ Category 1 incidents are classed as 'Major Incidents', resulting in fatalities, permanent disability, permanent lifechanging injuries or life threatening injuries.
 - ¹² Category 2 incidents are those that results in person(s) being hospitalised or receiving treatment from a health care professional
 - ¹³ Category 3 incidents are those that do not meet Category 1 or 2, including motor vehicle accidents where electricity did not contribute to the fatality/injury

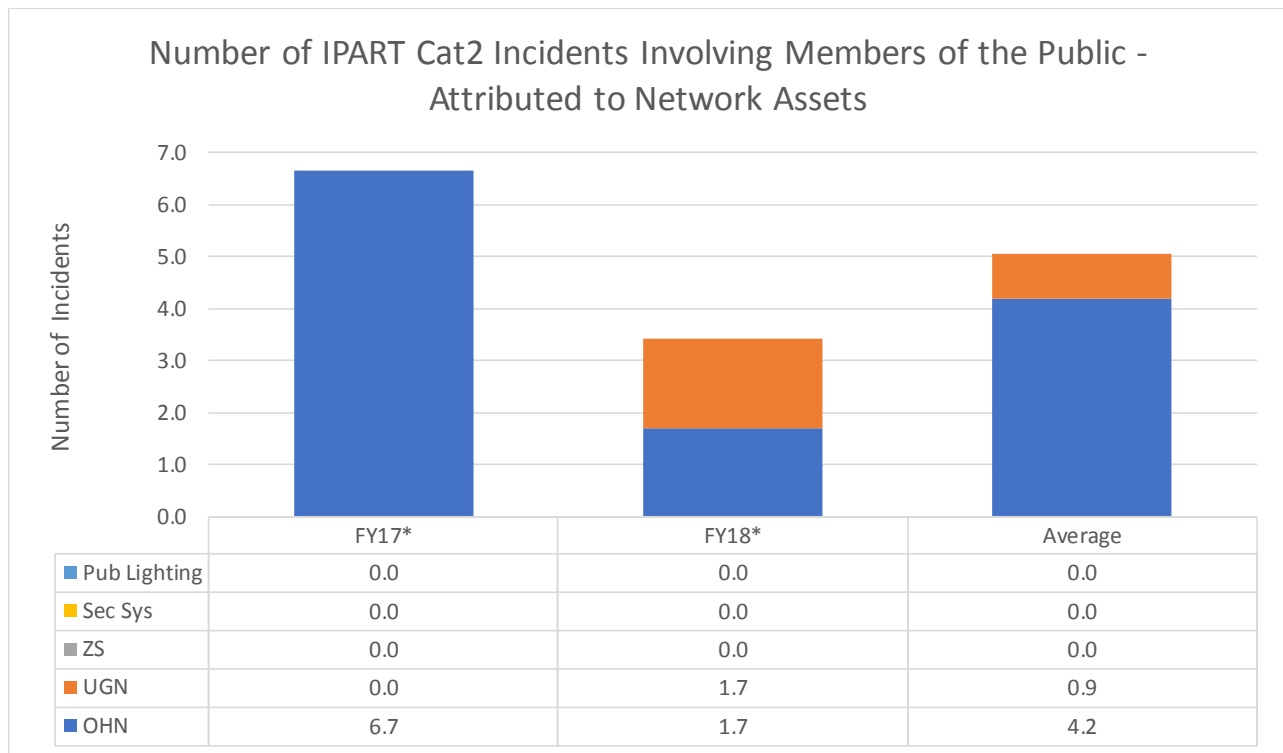


Figure 4 – IPART Category 2 Incidents Involving Members of the Public Attributed to Network Assets
(* Data calculated pro rata)

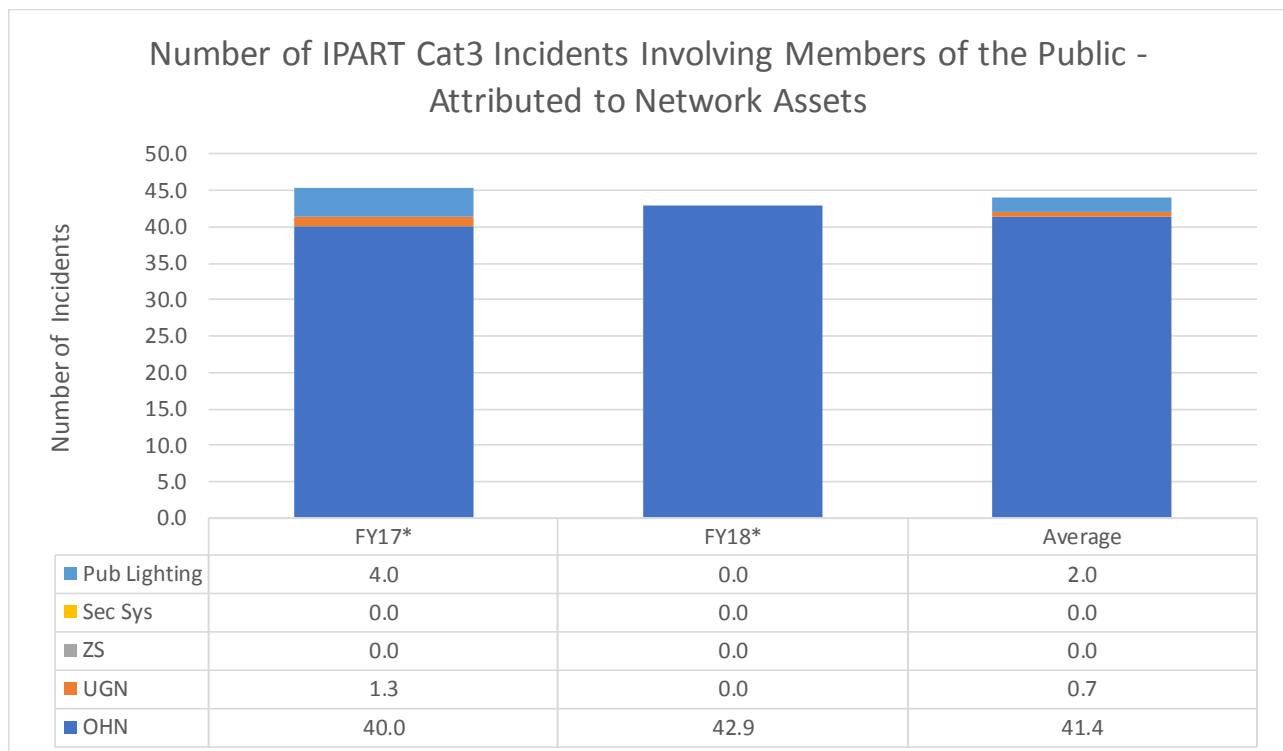


Figure 5 – IPART Category 3 Incidents Involving Members of the Public Attributed to Network Assets
(* Data calculated pro rata)

Key conclusions from this data are that:

- The overhead network is the main contributor to public safety incidents, near misses and property damage.
- Public lighting and the underground network are the other key contributors to public safety.

Similar trends are also observed in Near Miss data.

5.2 Bushfire

Figure 6 illustrates the network fire start data for the period FY13 – FY17, for each AMP.

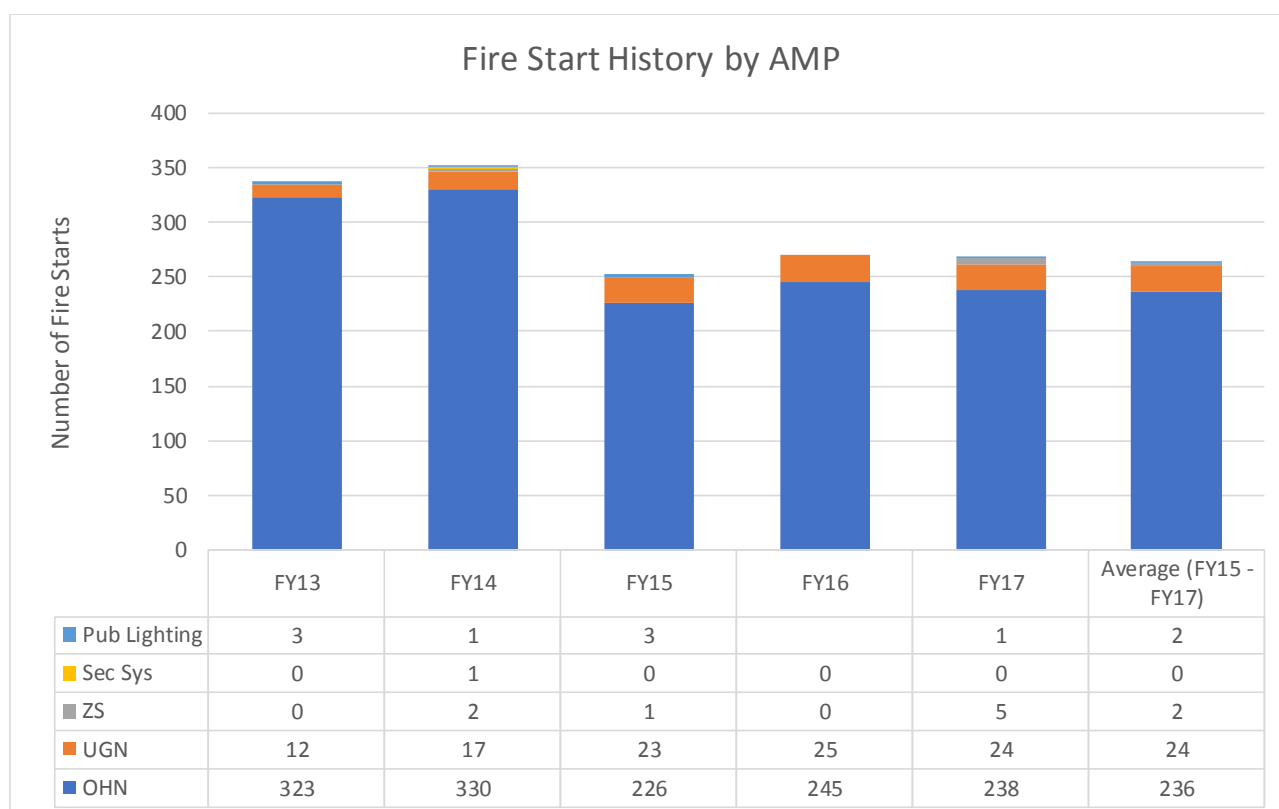


Figure 6 – Fire Start History by Network System (AMP)

This shows that the OH and UG networks are the main contributors to fire starts that are attributed to network assets. Over the 5yr period shown in the data, 99% of fire starts come from these two asset systems (93% from the OH network; 6% from the UG network).

5.3 Navigable Waterway Crossings

A program to address non-compliant navigable waterway crossings was instigated in 2011. Figure 7 shows the population profile as it was originally identified:

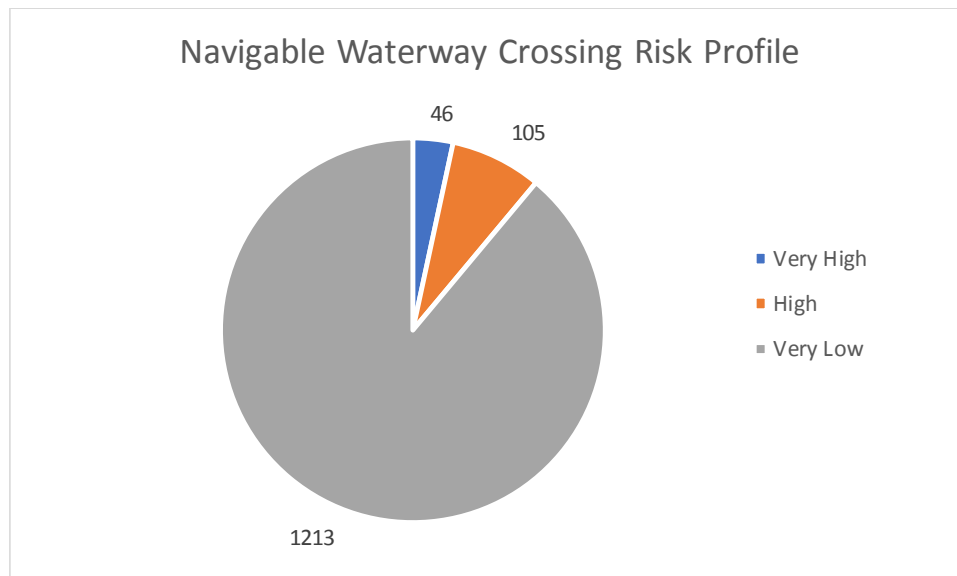


Figure 7 – Navigable Waterway Crossings Risk Profile

To date:

- All Very high and High crossings have been treated to reduce the risk to Very Low
- 8 crossings have been removed
- 127 crossings have been signed off by Roads and Maritime Services as managing the risk SFAIRP as a result of augmentation and signage.

5.4 Environment

This section sets out the current network level environmental performance against the following aspects:

- Pollution of waters
- Noise pollution
- Polychlorinated Biphenyl Compounds
- Asbestos
- SF6 Gas

5.4.1 Pollution of waters

Essential Energy is obligated to prevent and the pollution of waters under the POEO Act 1997. Environmental hazards, near misses and incidents, including those involving or potentially involving the pollution of water are logged in Essential Energy's incident management system TotalSAFE. Figure 8 shows the data from the period FY12 – FY17.

Oil spills have occurred, but we contained them by building bund walls (bundings). The major risk asset for oil leaks is transformers, both distribution and zone substation. A program of work is underway to ensure primary bunding, with suitable oil/water separation (depending on the area), is available for all zone substation transformers.

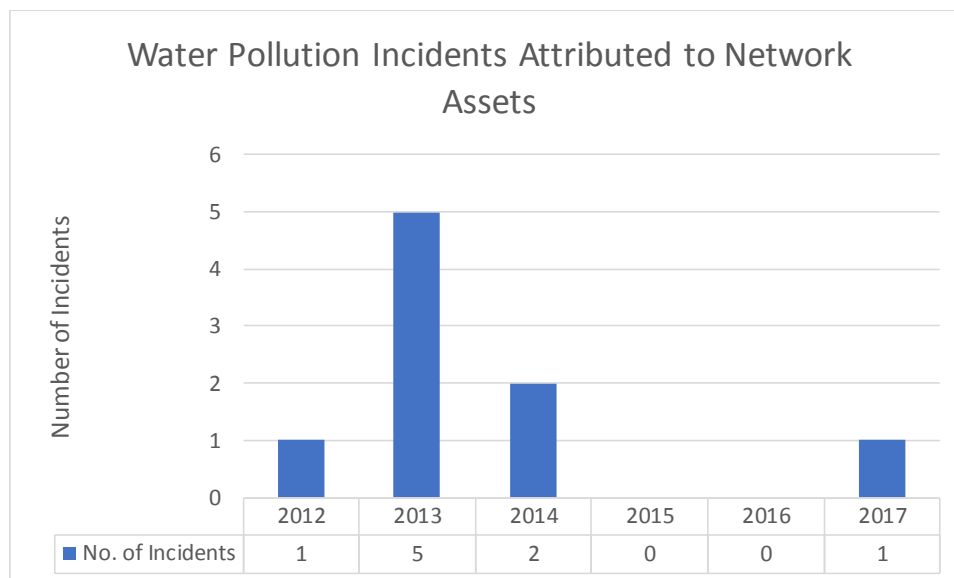


Figure 8 – Water Pollution Incidents Attributed to Network Assets (TotalSAFE)

Essential Energy's EMS also collects data on non-reportable pollution incidents (these may or may not lead to waterway pollution), as illustrated in

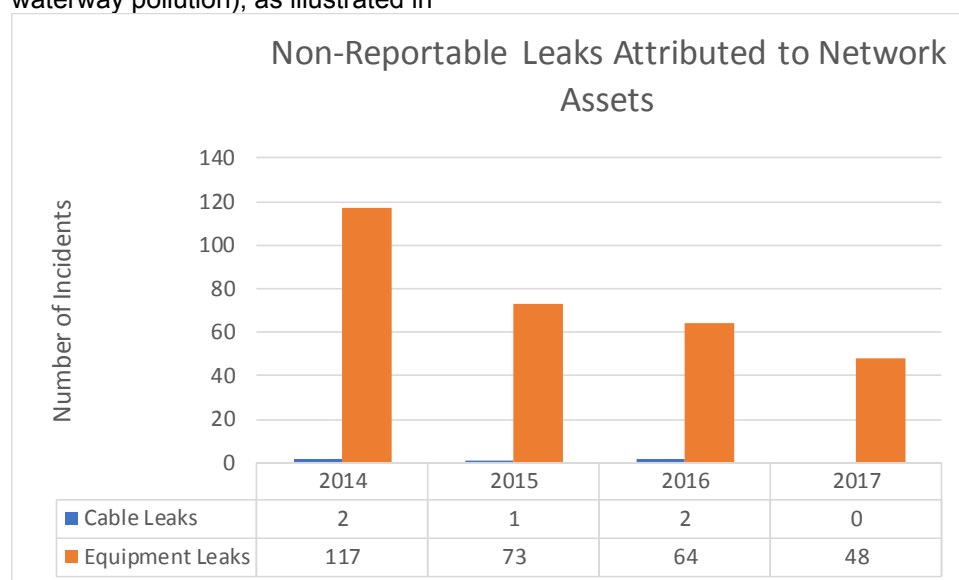


Figure 9. This shows a downward trend over recent years in cable and equipment leaks. While this information can be used as a leading indicator for a reportable incident, doing so does not indicate a larger incident will occur.

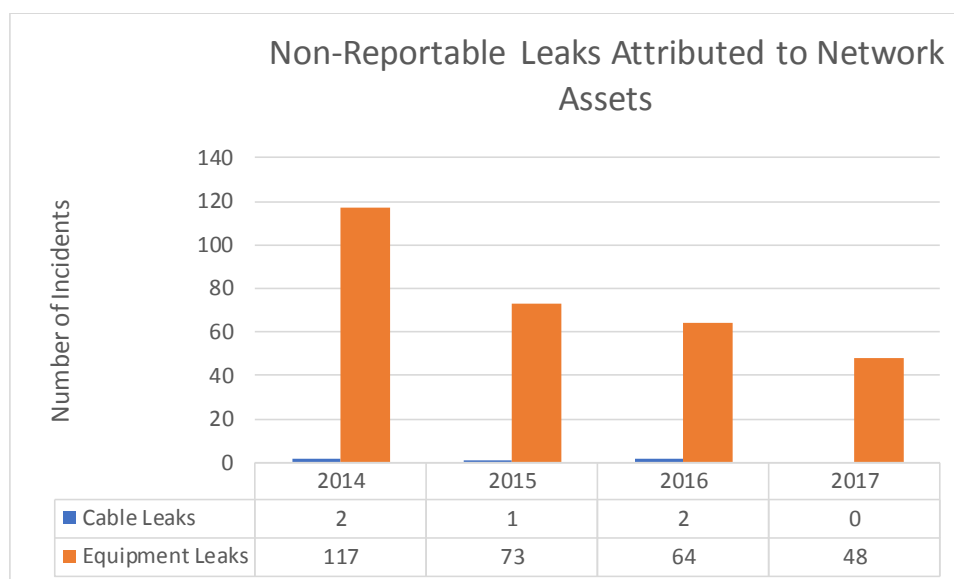


Figure 9 – Non-Reportable Leaks Attributed to Network Assets (TotalSAFE)

5.4.2 Noise Pollution

Noise generated from Essential Energy operational assets are guided by the NSW Noise Policy for Industry.

Any noise-related issues are likely to be from ageing equipment, as recently-acquired equipment is designed and constructed to comply with noise trigger levels as contained within the noise policy. As Essential Energy has recorded only one noise-related incident in the TotalSAFE system (in 2012), we will continue to adopt the approach of acting on complaints rather than actively monitoring all zone substation equipment.

Therefore, there are presently no outstanding projects to address noise pollution non-compliance.

5.4.3 Polychlorinated Biphenyl Compounds

In accordance with the EPA's *PCB Chemical Control Order 1997*, Essential Energy disposes of equipment that has non-scheduled PCB levels by approved methods.

Essential Energy disposed of PCB-contaminated power transformer oil with a concentration greater than 2ppm before July 2016, in alignment with the Control Order and because of the safety risk to staff who might come into contact with it.

We have other equipment that may have PCBs, including voltage transformers, current transformers and distribution transformers; however, there is no requirement to have a targeted program to remove such oil as the volumes involved are small.

With regard to the expected acquisition of additional sub-transmission equipment, no PCB service level gaps will arise as suppliers no longer ship new equipment containing PCBs (or they are less than a 2ppm concentration).

Distribution transformers are exempt under the Control Order due to their small oil quantity, but we test each transformer when it is removed from service to ensure our employees are not exposed to hazardous chemicals.

5.4.4 Asbestos

Essential Energy has one asbestos removal program in place. This targets low voltage pillars, as our employees and customers are regularly exposed to them. For other asbestos locations, the present strategy is to use education and training to minimise employee contact with asbestos and to address any issues through procedural changes. One example is the removal of fuses that contained asbestos from our stores, trucks and depots during FY16.

Figure 10 shows that unintentional staff contact with asbestos has been reduced - the last two years there were zero recorded incidents. Figure 11 documents the amount of non-compliant disposals conducted by our staff.

Although not captured in the figures, there has been a high occurrence of Accredited Service Providers and contractors incorrectly disposing of asbestos and leaving asbestos shavings inside meter boxes.

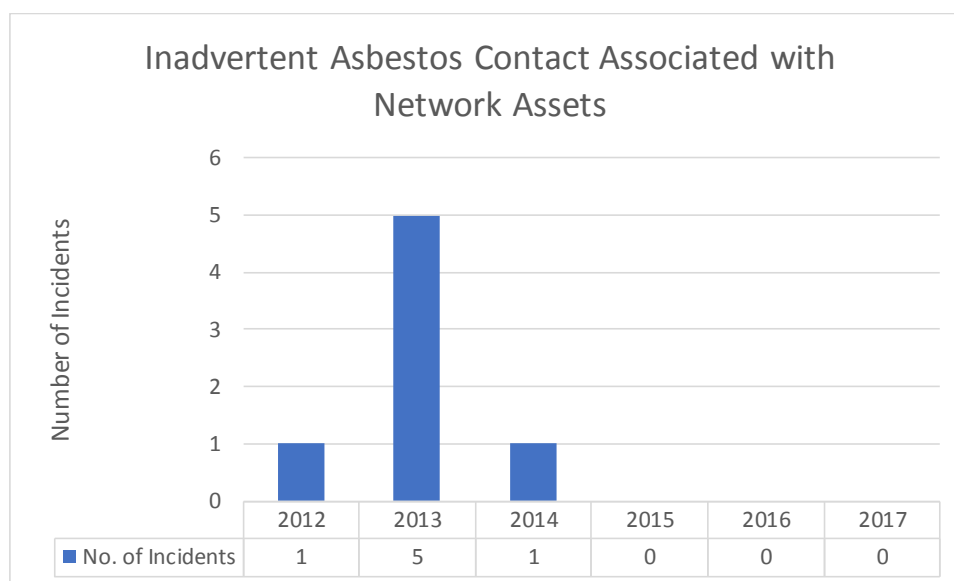


Figure 10 – Inadvertent Contact Associated with Network Assets (TotalSAFE)

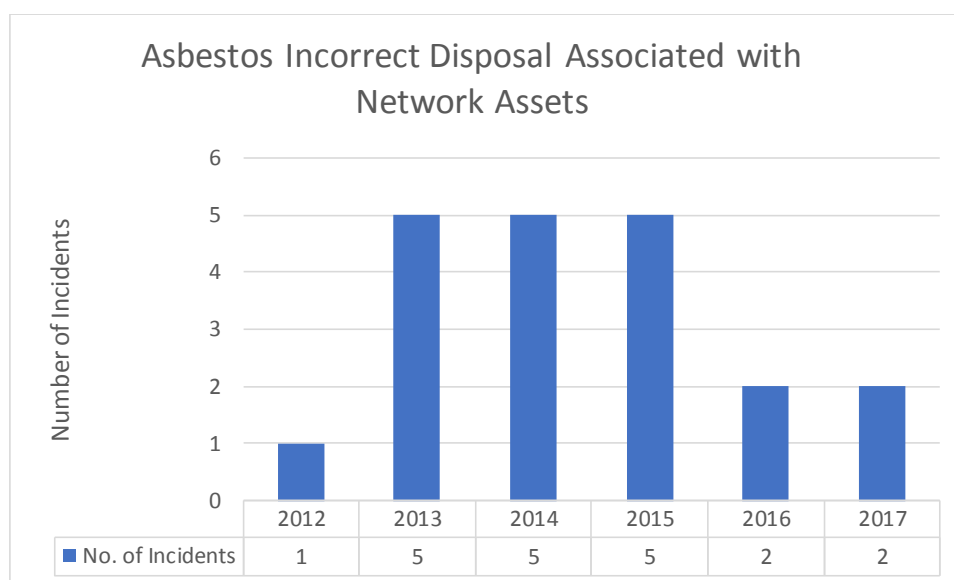


Figure 11 – Asbestos Incorrect Disposal Associated with Network Assets (TotalSAFE)

5.4.5 SF6 Gas

There is no legal obligation for Essential Energy to remove SF6 gas from our network. There has only been one recorded significant incident in the TotalSAFE system since FY11/12, when SF6 leaked from a failed asset. Minor leaks are more common.

The data indicates that no program is required to remove SF6 components. We complete our reporting of SF6 leakage under the *National Greenhouse and Energy Reporting Act 2007* through our EMS.

5.5 Managing Safety & Environmental Risk SFAIRP

Treatments identified in the Public Safety, Worker, Loss of Supply and Environment FSAs, required to ensure that existing network safety and environmental risks are managed SFAIRP include:

Public Safety:

- Targeted decommissioning of high risk or redundant assets
- Targeted remediation of low clearance spans, based on risk
- Targeted removal of OH lines near hazardous sites e.g. grain and stock loading facilities
- Convert overhead bare LV conductor to UG in high risk locations
- Installation of hi-vis markers to OH conductors e.g. in areas of aerial crop spraying
- Monitor trials of Remote Earth Fault Current Limiting (REFCL), currently being conducted in Victoria, to determine potential value to customers
- Targeted removal/relocation of high risk roadside poles
- Targeted undergrounding or insulating of network components and improved vegetation clearances to achieve more effective compliance with ISSC3 for vegetation

Worker:

- Asset strategies to include removal of hazardous substances as and when work is carried out on equipment
- Pursue more effective compliance with ISSC3 clearances for vegetation

Environment:

- Improve existing oil storage facilities, based on risk – to ensure compliance with AS 1940. Ensure new oil storage facilities comply with the requirements of AS 1940.
- Consider ceasing inspection, maintenance or operational activities in high risk environmentally sensitive areas, where alternative options are available
- Targeted procurement or use of less or non-hazardous materials
- Develop business-wide approach to oil management
- Targeted reduction of emissions causing nuisance to the community in high risk areas
- Implementation of an effective asbestos management program

5.6 Support for Renewable Energy Opportunities

New embedded generation connections to the network include photovoltaics (PV), wind generators, biomass fuelled generators and hydro-generators. The associated issues include:

- > What is needed to make a system work at a micro level.
- > Impacts on demand needs from local assets to network system perspectives.
- > Supply quality impacts on other customers, particularly where multiple small installations aggregate.

Essential Energy has established the 'Growth – Connections: Generation' category to support and manage the impacts of the connection processes.

5.7 Opportunities for Improvement

Table 2 describes process-related opportunities for improvement that would contribute to achieving the performance requirements. It is noted that the majority of opportunities described would also benefit other network

asset management objectives. As such, they should be considered as broad initiatives, beyond just safety and environment.

Opportunity for Improvement	How would this be achieved?	Expected benefits
Improved understanding of the factors that drive network safety and environmental performance and risk	Improved: <ul style="list-style-type: none"> • Data • Analysis tools • Analytics and forecasting capability 	Improved ability to target the drivers of network safety and environmental performance and risk
Improved understanding of where safety and environmental risk exists on the network – now and into the future		
More sophisticated approaches to network risk and value management	Continue to mature and embed the Asset Risk Management Procedure, Value Framework and related documents.	Improved decision making, to ensure that we are meeting our safety and environmental performance objectives while managing risk within tolerable limits and making decisions that are prudent and efficient Improved stakeholder confidence/reduced risk of adverse stakeholder attention
People & Culture	Targeted awareness, training and culture programs	Improved decision making; better performance and resilience
Improved management of risks and opportunities associated with technology and innovation	Enhanced methodologies for managing risks and opportunities of technology and innovation	Improved chance of realising opportunities/avoiding adverse outcomes

Table 2 - Process-Related Opportunities for Improvement

6 Safety and Environment Strategy

6.1 Strategic Options

Two strategic options are identified:

- Option 1 – Change Nothing
- Option 2 – Program of targeted strategic improvements

Option 1 includes two aspects:

1. Maintain the current network level performance by setting ‘maintain’ targets at current performance levels down to asset system or class
2. Maintain the current approach to managing safety and environmental performance, including delivery of the ‘work in progress’ initiatives described in Section 3.1

Option 2 would deliver additional improvements, beyond those described in Section 3.1, to continue to improve the maturity of our approach to meeting the performance targets, towards the corporate objectives.

6.2 Options Analysis

6.2.1 Safety

For achieving our safety performance objectives, Option 2 is recommended.

This reflects the significant emerging influences identified in Section 3.2. Key focus areas will include:

- Continue to embed the improvements identified in Section 3.1
- Establish specific, targeted programs to address the remaining opportunities for improvement set out in Section 5.6

6.2.2 Environment

For achieving our environmental compliance objectives, Option 1 is considered sufficient. While we did not meet our performance target in 2016/17, the majority of current controls are considered 'effective' and to be managing risk SFAIRP, with some minor improvements identified within the Environment FSA. No major contextual challenges are identified for the near-term, therefore, provided the control improvements currently identified are implemented, the current approach to managing performance should be sufficient.

In order to achieve the stated objective for providing support for renewables, it is recommended that we continue with the current program of trials, plus supplement these with a defined process for identifying and managing additional trials. This process should ensure that the objectives, risks, benefits and costs of the trials are fully understood, managed and evaluated.

6.3 Strategic Targets

6.3.1 Target Setting

Strategic performance targets have been set based on consideration of recent performance against the measures set out in Section 4.

The targets reflect the strategic objective to at least 'maintain' our current performance. In this context, current performance is defined as the average performance from the most recent 3 years of relevant data. Where 3 years of relevant data is not available, then the most recent annual performance has been used.

The performance targets reflect current maturity of data and performance analysis. As maturity in this area improves, the targets should be reviewed and, if necessary re-baselined.

The ultimate aim is to develop target risk levels, such that the safety and environment strategy is targeted at maintaining our current risk profile.

6.3.2 Targets

Table 3 sets out the strategic safety and environmental performance targets.

Table 3 – Strategic Safety and Environmental Performance Targets

Requirement Source	Measure	Strategic Targets					
		Network	OHN	UGN	ZS	Sec. Sys*	Pub. Light
<i>Work Health and Safety Act 2011</i> <i>Electricity Supply (Safety and Network Management) Regulations 2014</i> <i>National Electricity Rules</i> <i>Customer Expectations</i>	Number of Fatal/Serious Worker injuries attributed to assets in TotalSAFE per FY	≤3	≤2	≤0	≤0.5	0	≤0.5
	Number of Worker HPis attributed to assets in TotalSAFE per FY	≤5	≤2	≤1	≤1	0	≤1
	Number of Public IPART Cat 1 incidents attributed to assets in TotalSAFE per FY	0	0	0	0	0	0
	Number of Public IPART Cat 2 incidents attributed to assets in TotalSAFE per FY	≤5	≤4	≤1	0	0	0
	Number of Public IPART Cat 3 incidents attributed to assets in TotalSAFE per FY	≤45	≤42	≤1	0	0	≤2
<i>Planning for Bushfire Protection 2006</i> <i>Customer Expectations</i>	Number of fire starts caused by assets per FY (Maintain or reduce the risk associated with asset related firestarts. Note: Strategic targets based on historical average)	≤264	≤236	≤24	≤2	0	≤2
<i>NSW Maritime Crossings of NSW Navigable Waters: Electricity Industry Code 2009</i> <i>Customer Expectations</i>	Number of non-conforming sites	0	0	NA	NA	NA	NA
<i>Protection of the Environment Operations Act 1997 – Pollution of waters</i> <i>Customer Expectations</i>	Number of reportable water pollution incidents attributed to assets in TotalSAFE	0	0	0	0	0	NA
<i>Protection of the Environment Operations Act 1997 – Noise Pollution</i> <i>Customer Expectations</i>	Number of complaints relating to assets exceeding noise trigger levels per financial year	0	NA	NA	0	NA	NA
<i>PCB Chemical Control Order 1997</i> <i>Customer Expectations</i>	Number of polychlorinated biphenyl licence breaches	0	NA	NA	0	NA	NA
<i>Work Health and Safety Act 2011</i> <i>Protection of the Environment Operations Act 1997</i> <i>Customer Expectations</i>	Number of non-conformances related to identification, management and removal of asbestos-containing material	0	0	0	0	NA	NA
<i>Work Health and Safety Act 2011</i> <i>National Greenhouse and Energy Reporting Act 2007</i> <i>Customer Expectations</i>	Number of SF6 leakage incidents recorded in TotalSAFE	0	0	0	0	NA	NA

Note: All targets to be achieved by the end of FY24.

*Secondary systems include SCADA, telecommunication, generation, network metering and load control.

6.4 Strategy

The performance targets will be achieved through a combination of network infrastructure programs, implementation of the Safety Differently initiative, public safety awareness initiatives, renewable energy initiatives and process improvements.

6.4.1 Network Infrastructure Programs

Investment options are developed to meet the performance targets set out in Section 5 of this document. This shows a need to focus on the following asset classes/failure modes:

Public and worker safety and fire starts (OHN):

- Service Overhead Lines & Connections
- Low Clearance Conductors
- Navigable Waterway Crossings
- Conductor Clashing (LV Spreaders)
- OH Rural LV conversion to UG
- Wood pole failure
- Blackspot poles
- Pole Tops
- Two Pole Substations
- Potbelly and triangular streetlight columns
- Enclosed substations
- HV Cast Iron Potheads
- Vegetation Management

Public safety and fire starts (UGN):

- CONSAC Cable Replacement

Public safety and fire starts (ZS):

- Zone Substation Perimeter Fencing & Security
- Zone Substation Earthing

Environmental compliance:

- Enclosed substations (oil & SF6)
- Zone Substations (decontamination, noise, oil, asbestos, PCB)

Investments for renewable energy are planned to meet forecast customer demand, in line with compliance obligations (obligation to connect).

Options are fed into the overarching investment optimisation process. Through this process, safety and environmental investment and performance are optimised alongside other asset management and business objectives.

6.4.2 Safety Differently

As per Section 3.1.8, Essential Energy is currently working to implement its new Safety Differently strategic framework. This is expected to play a key role in supporting the achievement of the asset-related performance targets for workers.

As part of this strategy, a Safety Differently approach will also be investigated for application to public safety performance.

6.4.3 Public Safety Awareness Initiatives

Essential Energy will continue to use public safety awareness campaigns to raise electrical safety awareness and improve understanding in the general community and across key industry sectors about safety hazards associated with the electrical distribution network.

6.4.4 Process Improvements

Key enablers for the network infrastructure programs set out in section 6.4.1 will be a program of process improvements. This is in line with our core business objectives to 'operate at industry best practice levels of efficiency, delivering best value for customers'. It is also in line with the following elements of our strategic plan:

- Best practice systems, technology & processes
- Commercially capable people
- Enhanced risk-based asset management

Specific focus areas include:

- Safety and environmental **reporting, analytics and insights**: advancing our existing reporting, analytics and forecasting capabilities will provide us with improved insights into the causes and impacts of safety and environmental incidents, now and into the future. This will enable improved targeting of sustainable risk management measures.
- Maturing our approaches to safety and environmental **risk and value-based decision making**: Essential Energy has realised significant improvements in its approach to risk and value management in recent years. This progress needs to be built on to ensure that we keep risk levels within tolerable limits while maintaining a robust SFAIRP argument i.e. that we are doing enough, but not too much to manage safety and environmental risk. This work needs to be undertaken in collaboration with our key stakeholders to build awareness and understanding of our approach and to ensure that this meets with stakeholder expectations.
- Developing our **people and culture**: this is a strong theme within contemporary safety science, enabling and empowering people as a solution towards achieving safety performance goals. This is being implemented within Essential Energy through the Safety Differently approach, which is currently being developed for worker safety.
- Our approach to managing the safety and environmental risks and opportunities of new **technology and innovation**: As we enter a period of rapidly changing technology and network transformation, we need to be able to (i) effectively exploit and support new technologies that support us achieving our safety and environmental objectives, while (ii) actively identify and manage the safety and environmental risks from new technology or innovation that might adversely affect our ability to meet our objectives.
- Fit for purpose, quality, best practice safety and environmental **data, tools, systems, processes and procedures**: these are essential to achieving our performance objectives.

Key initiatives will include:

- Improve data structure and asset-related details in TotalSAFE: we will continue to improve the data collected in TotalSAFE in provide better alignment to the defined asset breakdown structure, failures modes and also to safety and environmental consequence categories in the asset risk management procedure and value framework.
- More sophisticated analytics, forecasting tools and people capabilities – these will be key to understand and forecast the safety and environmental performance and risk profile of network assets, including the impacts of different strategy and funding scenarios.
- Mature the current risk and value-based approaches to support increased use of quantitative models and tolerability criteria to inform decision making at individual asset and network levels
- Increased interaction with IPART and the AER to build a shared understanding of expectations and our approach to managing safety and environmental risks
- Review of our Asset Management System to implement the Safety Differently approach
- Review our existing processes to ensure they are aligned with best practice for the management of safety and environmental risks associated with new technology and innovation

All of these initiatives will be developed in parallel with AMS maturity improvements and improvements to the Essential energy Enterprise Risk Framework. The table below shows the indicative value of each initiative.

Initiative	Benefit (Risk Reduction)	Cost	Value (Benefit – Cost)
Improve TotalSAFE data	High	Low	+ve
Improve analytics and forecasting tools & capability	High	Medium	+ve
Mature risk and value-based approach	High	Medium	+ve
Build stakeholder awareness of approaches	Medium	Low	+ve
Implement Safety Differently principles within AMS	Medium	Low	+ve
Managing the safety & environmental risks of new technology and innovation	Medium	Low	+ve

Table 4 - Qualitative Value Assessment for Process Improvement Initiatives

7 Monitoring, Review and Continuous Improvement

The Network Safety and Environment Strategy owner will monitor for any changes to the network safety and environmental objectives, including regulatory changes.

The strategy owner will also monitor the implementation of the strategy, including its effectiveness in achieving the objectives. This will be addressed through an annual review process to consider the continuing appropriateness of the strategy.

The analysis underpinning the strategy should be refreshed at least annually in the first instance, reflecting the maturity improvements required in this area as part of the strategy. The outputs from this analysis will feed through to the respective network programs and investment portfolio as appropriate.

The strategy owner must also review for potential alternative strategies, emerging issues or trends. This should also be done on an annual process in the first instance.

The strategy owner will record any opportunities for improvement e.g. from audits or other internal reviews in a register. These opportunities will then be reviewed for incorporation into the annual strategy review process, which will align with the BAU business planning cycle.

Appendix A – Abbreviations

Abbreviations	Definition
AMP	Asset Management Plans
AMS	Asset Management System
ASP	Accredited Service Provider
CAG	Customer Advisory Group
ENA	Electricity Networks Australia
ENSMS	Electricity Network Safety Management System
EPA	Environment Protection Authority
FSA	Formal Safety Assessment
IPART	Independent Pricing and Regulatory Tribunal
ISSC	Industry Safety Steering Committee
NER	National Electricity Rules
NWQMS	National Water Quality Management System
OHN	Overhead Network
PBP	Planning for Bushfire Protection
PCB	Polychlorinated Biphenyl Compound
POEO Act	Protection of the Environment Operations Act
Pub. Light	Public Lighting
SAMP	Strategic Asset Management Plan
Sec. Sys	Secondary Systems
SF6	Sulphur Hexafluoride
SFAIRP	So Far As Is Reasonably Practicable
UGN	Underground Network
Veg	Vegetation
YTD	Year To Date
ZS	Zone Substation

Appendix B – Referenced Document, Policies and Legislation

Internal Documents

Document	Relevance to Network Strategy
CECM1000.73 - <i>Safety, Security, Health and Environmental Manual: Water</i>	Internal documents that provide guidance for target setting, process flow or is an output of the AMS.
CECM1000.10 - <i>Safety, Security, Health and Environmental Manual: Hazardous Materials</i>	
CEOP8005 - <i>Public Electrical Safety Awareness Plan (PESAP)</i>	
CEOP4304.11 - <i>Legislative Register</i>	
CECP8096 - <i>Electrical Safety Policy</i>	
CECM1000.02 - <i>Safety and Environment Manual Risk Management Framework</i>	
CECP0002.03 - <i>Risk Management Policy</i>	
CEOP2111.01 - <i>Asset Risk Management</i>	
CECP0002.32 - <i>Financial Management Investment Evaluation Procedure</i>	
CEOP8022 - <i>Bushfire Management Plan</i>	
<i>Strategic Asset Management Plan</i>	Key output document of the AMS.
<i>Network Strategies</i>	
<i>Investment Cases</i>	
<i>Asset Management Plans</i>	

Legislation

Document	Relevance to Network Strategy
<i>Electricity Supply Act 1995</i>	Legislation that Essential Energy must adhere to. Provides guidance to safety based target setting and used to meet the Asset Management Objective on compliance.
<i>Work Health and Safety Act 2011</i>	
<i>Work Health and Safety Regulation 2011 (NSW)</i>	
<i>Electricity Supply (Safety and Network Management) Regulation 2014 (NSW);</i>	
<i>National Electricity Rules (NER)</i>	
<i>Work Health and Safety Regulation 2011 (QLD)</i>	
<i>Electrical Safety Act 2002</i>	
<i>Electrical Safety Regulation 2013</i>	
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	Legislation that Essential Energy must adhere to. Provides guidance to environmental-based target setting and used to meet the Asset Management Objective on compliance.
<i>Environmentally Hazardous Chemicals Act 1985</i>	
<i>Environmental Planning and Assessment Act 1979</i>	
<i>National Parks and Wildlife Act 1974</i>	
<i>Biodiversity Conservation Act 2016</i>	
<i>PCB Chemical Control Order 1997</i>	
<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>	

Standards

Document	Relevance to Network Strategy
<i>Planning for Bushfire Protection (PBP) 2006</i>	Standards used to set environmental-based targets.
<i>ISSC3 – Vegetation Management 2016</i>	
<i>National Water Quality Management Strategy (NWQMS)</i>	
<i>Navigable Waters: Electricity Industry Code 2008</i>	Standards to set navigable water crossing targets.
<i>AS 6947 Crossing of Waterways by Electricity Infrastructure</i>	
<i>Code of Practice – Electricity Transmission and Distribution Asset Management 2009</i>	Standards to provide guidance to the AMS.
<i>AS 5577:2013 - Electrical Network Safety Management Systems</i>	
<i>AS/NZS ISO 31000 - Risk Management</i>	
<i>CECM1000.73 - Safety, Security, Health and Environmental Manual: Water</i>	Internal documents that provide guidance for target setting, process flow or are an output of the AMS.