Jemena Electricity Networks (Vic) Ltd

JEN – RIN – Support – LBRA Hazard Tree Management Program – Business Case – 20250131

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Glossary

Hazardous Bushfire Risk Area	Region classified as having a high potential for bushfire occurrence as defined by the Country Fire Authority (CFA).
Hazard Tree Management Program	A structured program that is aimed at identifying, assessing and mitigating risks associated with trees that pose a threat to public safety, infrastructure, or environmental stability.
Hazard Tree Program Arborist	Identifies, assesses and manages trees within high bushfire risk areas to ensure public safety, infrastructure protection, and compliance with bushfire management standards.
Hazard Tree	Any tree that is likely to fall onto or come into contact with an electric line, as determined by a suitably qualified arborist
JEN 2026-31 Draft Plan (Draft Plan)	An early version of the 2026-31 electricity distribution price reset proposal was released in August 2024 to consult with customers.
Low Bushfire Risk Area	Region identified as a having a lower likelihood of bushfire occurrence as determined by the Country Fire Authority (CFA).
Next regulatory period	The regulatory control period covering 1 Jul 2026 to 30 Jun 2031.
Vegetation Assessor	A Vegetation Assessor evaluates and analyses plant species, health, and ecosystems to support environmental management and compliance, particular in relation to Electric Line Clearance.
Vegetation Management Program Leader	The Vegetation Management Program Leader oversees the planning and implementation of vegetation management activities in JEN, ensuring compliance with regulations and mitigation of network risks.

Abbreviations

AFAP	As Far As Reasonably Practicable
EDCoP	Electricity Distribution Code of Practice
ELCMP	Electric Line Clearance Management Plan
HBRA	Hazardous Bushfire Risk Area
HV	High Voltage
JEN	Jemena Electricity Networks (Vic) Ltd.
LBRA	Low Bushfire Risk Area
NEO	National Electricity Objective
NER	National Electricity Rules
ST	Sub Transmission
UHI	Urban Heat Island
VMS	Vegetation Management System

1. Executive Summary

Synopsis

- Distribution equipment in urban feeder areas is vulnerable to damage due to the presence of trees and branches that are likely to fall onto or come into contact with the assets, posing a safety hazard to members of the public and utility workers. The risk of trees and branches damaging the network is increasing.
- Four options have been considered to manage these risks. The recommended option is to implement a Hazard Tree management program by hiring an arborist to identify and manage Hazard Trees in the Low Bushfire Risk Area.
- This project is proposed to be ongoing from 2026 onward with an economic analysis preferred for the 2026-31 regulatory control period (**next regulatory period**).

1.1 Business need

Contact between vegetation and electricity infrastructure is hazardous and can lead to fire starts and electrocution from fallen conductors. With the greening of suburbs, an increased amount of vegetation is situated around electricity distribution infrastructure. Due to tree growth, an increased proportion of trees outside of the clearance space have the potential to fall onto or come into contact with electricity distribution equipment such as poles and wires.

In **Low Bushfire Risk Area** (**LBRA**) network areas, **Jemena Electricity Networks (Vic) Ltd**. (**JEN**) operates a Vegetation Assessment Program involving routine inspection and clearing of the regulated electric line clearance space. Unlike in the **Hazardous Bushfire Risk Area** (**HBRA**) where there is an established **Hazard Tree Management Program** that involves identification and assessment of **Hazard Trees** by vegetation assessors, the primary focus in the LBRA is on the clearance space. In addition, the assessors are not qualified arborists which limits their ability to identify Hazard Trees. Consequently, the current detection rates of Hazard Trees outside the clearance space is extremely low.

Hazard Trees are trees that are likely to fall onto, or come into contact with, an electric line usually due to the physical condition of the tree or immediate environmental surroundings. As a result, Hazard Trees have a higher probability of failure during extreme wind events, increasing the probability of damage to poles and wires which may cause supply interruptions. Depending on the size of the tree, this can often result in electric lines being brought to the ground, presenting an unacceptable risk to members of the public and our workers.

Two key safety risks are considered in this business case; the risk of contact by Hazard Trees resulting in live bare conductors on the ground and the risk of fire starts occurring through contact of assets with trees or other assets. Live bare conductors on the ground or at reduced heights pose a catastrophic consequence of electrocution if a member of the public comes into contact with the conductors (or accidentally energised structures). Fire starts pose the potential for very serious consequence, leading to pole fires, grass fires or worse.

Table 1-1: Current Issues associated with LBRA trees

Issue No.	Description of Issue
1	Electrocution – Live bare conductors on the ground or at reduced heights pose a catastrophic consequence of electrocution if a member of the public comes into contact with the conductors or accidentally energised structures.
2	Fire Starts – Fire starts pose the potential for very serious consequence, leading to pole fires, grass fires.

Issue No.	Description of Issue
3	Maintaining Network Reliability – Trees that fail and contact poles and wires have an adverse impact on network supply reliability.
4	Hazard Tree Assessment – The assessment of trees outside of the regulated electric line clearance space by a qualified arborist has not previously been performed in the LBRA.

Four options have been considered. The preferred option (option 4) is a strategic initiative that will reduce the public safety risk posed by the network whilst ensuring supply reliability of the network is maintained:

1. Do nothing
2. Underground High Voltage (**HV**) and Sub transmission (**ST**) lines adjacent to Hazard Trees
3. Reroute line, offset crossarms and apply covered conductor to HV and ST adjacent to Hazard Trees
4. Hire an arborist and initiate an LBRA Hazard Tree management program **(preferred option)**

1.2 Recommendation

It is recommended that an arborist be hired and embark upon a Hazard Tree management program in the network's LBRA. The objective is to improve network safety, particularly during weather events when incidents are more likely to occur, through a targeted focus on Hazard Trees. This option will address operational safety concerns and secondarily maintain network reliability by treating the hazard these trees pose. This alternative is more practical and significantly more financially viable than the alternatives.

The proposed program will require:

- Hire of a dedicated arborist
- Assessment based on a two-year assessment cycle
- Cutting, removal or management of identified Hazard Trees

The total operating expenditure for this project is expected to be $500k per annum.

1.3 Legal and regulatory considerations

The impact of the following legal & regulatory obligations, which JEN adheres to and complies with, are considered during the assessment,

- Electric Safety (Electric Line Clearance) Regulations 2020 - Regulation 9
- Electricity Safety Act 1998 - S. 83B
- Electricity Safety Act 1998 - S. 98

Further reference to how this business case meets these obligations is captured in section 2.2 below.

The full details of the applicable regulations are found in **Error! Reference source not found.**.

2. Background

Changes to the climate are bringing about worse storms and more severe weather events, which pose increased challenges in managing and operating the electricity distribution network. Climate science shows unequivocally that the frequency and severity with which these events occur is trending upward. Changed prevailing wind direction, another result of climate change, also significantly increases the likelihood of downed vegetation.

A greater frequency of incidents where an increased volume of vegetation is brought down poses risks to the operational safety of JEN's network and the safety of the communities we serve. The risk is prevalent due to the increase of incidents occurring in line with more frequent and severe weather events. An increase in hazard is observed when more established trees that are in poor health become Hazard Trees, and due to their large mass and height, they have the potential to cause significant damage.

Melbourne suburbs are greening. Whilst this meets council and community expectations, it creates an issue as a majority of the network managed by JEN is located in urban/suburban areas. Structural failure of the whole, or part of larger trees that are in poor health is of particular concern as the likelihood of contact with electrical assets within its line of fall is increased.

The resulting increase in volume and size of trees combined with increased frequency and severity of inclement weather is causing an increase in the likelihood and consequence of the risk events occurring, and to the extent of damage that occurs. The number of vegetation line contact and damage incidents caused by vegetation contacting and damaging electrical lines from outside of the clearance space is increasing. Additionally, management of Hazard Trees that would otherwise be likely to contact electric lines will help to retain current levels of network reliability even with increased weather events. During weather events that impact large areas and cause widespread damage, restoration times are expected to be substantially improved due to reduced work volumes.

Hazard Trees

A Hazard Tree is defined as any tree that is likely to fall onto or come into contact with an electric line, as determined by a suitably qualified arborist.[1] In the LBRA, vegetation overhanging lines is permitted provided it is outside of the minimum clearance space at all times. Pruning and cutting of vegetation to comply with clearance space requirements as per Electricity Safety (Electric Line Clearance) Regulations 2020 does not necessarily eliminate the risk of Hazard Trees as, by definition, they exist outside of the codified clearance space.

With the greening of Melbourne and the growth of vegetation, there are a greater quantity of trees that overhang electric lines or are otherwise large enough that, if they were to fall, they could come into contact with lines. Removal of every tree and branch that has the ability to fall upon lines would clearly be unacceptable by the community, nor is it necessary as many trees and branches would not be classified as Hazard Trees.

JEN currently has a dedicated HBRA Hazard Tree Program to identify and manage vegetation that is likely to fall on network infrastructure. However, there is currently no dedicated program or initiative for managing Hazard Trees within the LBRA outside of the electric line clearance space.

Proposed LBRA Dedicated Hazard Tree Management Program

JEN's proposed dedicated **Hazard Tree Management Program** will identify and manage vegetation that is likely to fall on electricity distribution infrastructure. The process for the assessment of trees for the Hazard Tree Management Program is detailed and should be assessed by a qualified arborist as per the regulations. The risk of these trees coming into contact with the network requires assessment of several factors:

- Sufficiently likely to fail such that it poses an unacceptable risk;
- Be of sufficient size to reach electric lines should it fail;

[1] JEN, *BFM20 – Electric Line Clearance Management Procedure of JEN Bushfire Mitigation Plan 2024-2029*, (08 November 2024)

- Failure will result in sufficient falling momentum of vegetation such that it could cause damage of concern (conductors down etc); and

- Fall in the direction of electric lines.

Currently, Hazard Trees and any obvious and problematic trees in LBRA areas are identified as part of the routine vegetation management program by vegetation assessors or alternatively by members of the public. Upon identification, a full assessment is undertaken by a qualified arborist before further action can be taken.

The existing assessment program is primarily focused on the clearance space, and Hazard Trees can be overlooked due to the intricate nature of identification.

Existing HBRA Dedicated Hazard Tree Management Program

In 2013, JEN introduced a dedicated and ongoing Hazard Tree Management Program across the entire HBRA network region. The 2-year cyclic program delivered a 70% decrease in the number of incidents due to vegetation contact and a reduction in the number of fire starts. In the first cycle, 994 Hazard Trees were identified and were subsequently removed or trimmed. Prior to the introduction of the dedicated program, an average of 50 trees were removed and 100 were cut each year in the HBRA and evidently many Hazard Trees remained despite the ongoing established routine vegetation assessment program. This is a natural consequence of growing vegetation.

The number of trees identified in the first year demonstrated that detection of Hazard Trees under the routine vegetation assessment program was insufficient. The dedicated HBRA program requires an arborist with a minimum qualification of National Certificate Level III in Arboriculture or equivalent qualification and at least three years of experience in assessing trees to ensure that Hazard Trees can be adequately detected to mitigate the risk posed.

HV and ST electric lines are prioritised for assessment within the HBRA dedicated Hazard Tree Management Program. Low Voltage bare mains in the HBRA are being removed or replaced with insulated conductor as a part of a separate initiative.

2.1 Consumer engagement

2.1.1 Overview of consumer sentiment and relationship to this business case

To understand its customers' views and concerns, JEN undertook a comprehensive customer engagement program over many years as part of the price review process for the next regulatory period.[2] In this process, JEN engaged [redacted] to support and prepare a customer research report utilising insights gathered from our People Panel and Customer Voice Groups. Additionally, following the public release of the JEN **2026-31 Draft Plan (Draft Plan)**,[3] JEN received submissions that commented on key inclusions within the Plan.

In feedback received, our customers told us,[4] maintaining network reliability was of the highest importance to customers, with 87% of respondents saying that they carried a high degree of importance compared to other priority areas respectively.[5]

JEN's continuing commitment to the reliability of network was also indicated through customer feedback reports to the JEN Draft Plan:

2 JEN, *Attachment 02-01 Regulatory Proposal – Customer Engagement*, 31 January 2025.

3 JEN, *2026-31 Draft Plan*, 22 August 2024.

4 JEN, *Jemena Price Reset – Customers Priorities research Report*, August 2024.

5 JEN, *Jemena Price Reset – Customers Priorities research Report* (August 2024) pg.19

> *…the strategy appears to be future focused and is a fairly comprehensive, 'whole of system' approach. The document itself is clear and digestible to even the average layperson and highlights a commitment to reliability though rapidly changing times.*[6]

However, throughout all stakeholder feedback, there was a recurring sentiment that, while network security and reliability are important to customers, it must also be balanced within careful tree management to reduce the impact of the Urban Heat Island (**UHI**) effect. Within the report prepared by [redacted] consultants, it was stated that:

> *In summary bushfire recovery costs should be spread equitably and the focus should be more on mitigating the risks of electricity infrastructure as ignition sources through affordable, and where possible shared cost solutions; recognising this will occur in the context of competing priorities at a local government level to balance bushfire protection and increased canopy cover.*[7]

Additionally, within the responses to the Draft Plan, one customer raised concerns regarding the impact of bushfire mitigation processes on urban forest coverage:

> *While we recognise the importance of public safety and network resilience, the proposed changes would likely result in the removal of many trees, particularly mature ones that provide essential environmental and social benefits.*[8]

When developing the business case regarding the management of Hazard Trees, consideration was given to the impact of pruning procedures on ground coverage to mitigate the UHI effect. This was done while also ensuring that any risks related to encroaching tree growth's proximity to the network were addressed.

2.1.2 Jemena's People Panel

JEN's People's Panel is an iterative consultation mechanism which was formed to represent customers from across JEN's network and to help us understand how we can prepare for a sustainable energy future, while meeting customer and community needs today. The People's Panel is a diverse selection of JEN's customers, incorporating all walks of life - cultural diversity, age, gender and geographic location. For reference, the People's Panel spent many weekends and on-line sessions, learning about the role we play in the electricity supply network.

Throughout this process, the People's Panel, provided a recommendation for JEN to focus on network reliability:

> *"Jemena needs to prioritise investing in safety and reliability by assessing, building and maintain the network to meet changes in operating conditions and withstand network failures."* [9]

This proposed expenditure meets customer expectations that we maintain a reliable network by:

- this project of works will ensure reliability by ensuring that Hazard Trees are identified by a suitably qualified arborist, and a program of works related to tree cutting are established to ensure that they do not encroach on network lines.
- hiring a suitably qualified arborist will ensure Hazard Tree scenarios are assessed appropriately, and the best course of action related to the Hazard Tree management is undertaken. For example, an arborist can identify specific limbs or branches that threaten to fall into the lines required to be cut or that overhanging branches can be thinned rather than removing the tree entirely to avoid structural failure. This will assist in mitigating customer concerns regarding the removal of trees and exacerbation of the UHI effect.

6 JEN, *Jemena Electricity Networks Feedback on 2026-31 DRAFT PROPOSAL* (September 2024) pg.11

7 [redacted] Consultants, *Energy Reference Group Jemena Electricity Networks Consolidated report* (May 2024) pg.11.

8 Jemena, *Jemena Electricity Networks Feedback on 2026-31 DRAFT PROPOSAL* (September 2024) pg.51.

9 JEN, *Jemena Electricity Networks Feedback on 2026-31 DRAFT PROPOSAL* (September 2024) pg.35

The alignment of our consumer engagement program with AER expectations has been detailed further in our broader regulatory proposal.[10]

2.1.3 Customer Engagement with Council

As one of the major stakeholders for the proposed changes to Hazard Tree management, engagement with local councils was made. Concerns were raised by councils over the likely removal of many trees, particularly mature ones that provide essential environmental and social benefits.

Reassurance was provided to council that the program will focus only on a Hazard Tree, not healthy, structurally sound trees and will be conducted by a suitably qualified arborist. There is no focus on tree pruning or seeking to expand existing tree pruning on healthy trees or clearance space distances. Consultation with local councils will be undertaken before any scheduled work.

In handling Hazard Trees, it is impractical and environmentally damaging to remove all Hazard Trees. Before any pruning or removal of a Hazard Tree, we consider factors such as:

- Habitat for rare or endangered species.
- Environmental or cultural significance of the area.
- Alternative construction methods to avoid tree cutting.
- Public safety, supply reliability, and site aesthetics.
- The environmental and ecological impact of the proposed works.

Most Hazard Trees are not pruned or removed. For example, in the first inspection cycle across the hazardous bushfire risk area, only around 20 trees were removed whilst the remaining 974 trees were either monitored or pruned.

If a tree needs pruning or removal, with exception to emergencies, no tree will be pruned or removed without at least 14 day's notice provided to the local council. If a local council disagrees with an assessment, a negotiation process is in place, with escalation options if necessary. In our experience, disputes over the safe outcome of Hazard Trees are rare, as they typically involve dead or dying trees.

It's therefore not expected that the removal of Hazard Tree vegetation will have significant impact on canopy targets given the estimated scale and scope of the program detailed further in this paper.

2.2 Identified Need

The hazard posed by large trees upon electric lines in LBRA regions of the Jemena electricity distribution system has grown. Over time, tree growth and worsening weather conditions have led to vegetation posing a greater safety hazard. There is currently no dedicated program in place to manage Hazard Trees in the LBRA.

Under Section 98 of the Electricity Safety Act 1998, JEN is required to minimise hazards and risks to the safety of any person or property and bushfire danger arising from the supply network As Far as Reasonably Practicable (**AFAP**)[11]. To ensure that Jemena is compliant with the AFAP principle it is recommended that the preferred option be adopted immediately to manage the risk that Hazard Trees have grown to pose.

Assessment of the hazard posed to the network by large trees requires specific knowledge, understanding and experience. A suitably qualified arborist has the necessary qualifications to be able to accurately assess a Hazard Tree scenario based upon many factors such as tree species, condition, prevailing weather conditions and land contours. It is for this reason that Regulation 9 of the Electric Line Clearance Regulations 2020 (see Appendix B1) sets out the requirement for an arborist to conduct this assessment. Whilst there is no obligation to clear trees outside of the regulated electric line clearance space, Regulation 9 permits the responsible person to cut or remove Hazard Trees, irrespective of whether it is likely to grow into the minimum clearance space.

[10] See JEN, *Attachment 02-01 Regulatory Proposal – Customer Engagement*, 31 January 2025.

[11] Steps to reduce risk to the extent that is reasonable, given the costs and other factors.

2.2.1 Recent Historical Context

Vegetation contact from outside of the clearance space resulting in supply faults has been of prevalent occurrence in recent years.

Table 2-1 provides an overview of the number of outages caused by fallen vegetation throughout the last four-year period within the LBRA due to blow ins/fall ins, i.e Hazard Trees, as captured by Regulatory Information Notice data.

Historically it has been observed that the number of outages due to vegetation is proportionate to the number of significant weather events experienced in that particular year where, in particular, in October 2021 (FY22) JEN experienced a succession of significant weather events contributing to an additional 84 incidents in that month alone. Comparatively, in FY23 & FY24 there were significantly less weather events resulting in vegetation contact with assets leading to outages.

Table 2-1: Number of outages caused by fallen vegetation per year (FY21-FY24)

	FY21	FY22	FY23	FY24	Total
LBRA – No. of outages caused by fallen vegetation	88	152	37	51	328

Source: JEN's Regulatory Information Notice (RIN) submission data, *however:*

- includes outages due to 'Vegetation – 'Blow Ins/Fall Ins'' – *these are considered Hazard Trees*
- includes outages caused by both NSP responsible and Other Responsible Party (Council) trees
- excludes outages due to Vegetation – 'Grow Ins' – *these are considered an ELC obligation*

Table 2-2 below details the worst effected zone substation supply areas across this same 4 year period summarising the no. of outages by supply area. It's observed that the zone substation supply areas with the highest no. of faults due to fallen vegetation are predominantly the most heavily vegetated and leafy areas often with dense suburban living. North Heidelberg in particular is of note.

Table 2-2: Number of outages (10+) sustained by ZSS area between FY21-24

Zone Substation Supply Area	No. of outages from fallen vegetation
North Heidelberg (NH ZSS)	53
Airport West (AW ZSS)	41
Heidelberg (HB ZSS)	35
Pascoe Vale (PV ZSS)	17
Newport (NT ZSS)	15
Braybrook (BY ZSS)	14
Coburg South (CS ZSS)	14
Coburg North (CN ZSS)	13
East Preston (EPN ZSS)	13
North Essendon (NS ZSS)	11
Broadmeadows (BD ZSS)	11
Footscray West (FW ZSS)	10

2.3 Business and Socio-economic Context

All vegetated HV and ST spans within the LBRA that may contain Hazard Trees are within the scope of this initiative. Vegetation that is located on council, private or privately owned land that falls under the responsibility of JEN are included within the scope.

The Jemena Electric Line Clearance Management Plan (**ELCMP**[12]) contains a process for consultation with those affected by tree cutting or removal. [13] This process contains notification, consultation and negotiation steps.

Historically on the JEN network, consultation with customers regarding the management of Hazard Trees has resulted in the negotiation of a satisfactory resolution for both the network and the customer. The community is considered through consultation, usually via council, during the notification process usually occurring when there is impact to council significant trees. Trees are recognised as significant for various reasons such as ecological, historical, aesthetic, cultural, environmental, habitat or species. This is consistent with our standing vegetation management program consultation processes for electric line clearance detailed further in the ELCMP.

The cutting of JEN responsible trees is conducted in accordance with the Australian Standard AS 4373-2007, 'Pruning of amenity trees' which specifies correct pruning methods and cutting standards. Hazard Trees are pruned to the same standards.

12 JEN, 10.6 *Electric Line Clearance Management Plan 2021-2026*, (June 2023)

13 JEN, *Electric Line Clearance Management Plan 2021-2026*, (June 2023) pg. 49

2.4 Safety & Risk Analysis

2.4.1 Identification of risks.

The two (2) key public safety risks associated with Hazard Tree management in the LBRA that have been identified and assessed are:

1. Vegetation outside the clearance space (Hazard Tree) contacts or falls into an electric line causing an energised bare conductor to be brought down less than 4.3m above the ground leading to electrocution

2. Vegetation outside the clearance space (Hazard Tree) contacts or falls into an electric line causing an asset failure that leads to the ignition of a fire start .

2.4.2 Risk assessment

Figure 1**Error! Reference source not found.** illustrates the risk matrix that JEN applies when assessing the identified risks.

Figure 1 - Risk matrix

Likelihood		Consequence				
		1	2	3	4	5
		Minor	Serious	Severe	Major	Catastrophic
5	Almost Certain	Moderate	High	Extreme	Extreme	Extreme
4	Likely	Moderate	Significant	High	Extreme	Extreme
3	Possible	Moderate	Moderate	Significant	High	Extreme
2	Unlikely	Low	Low	Moderate	Significant	High
1	Rare	Low	Low	Moderate	Moderate	Significant

1. **Live Conductor less than 4.3m above the ground due to vegetation contact from outside of the clearance space (Hazard Tree) leading to electrocution**

Note: all HV and ST electric lines of the JEN network are bare (uninsulated).

From 2021-2024 there were 10 incidents of live conductors on the ground due to vegetation contact from outside of the clearance space caused by Hazard Trees.

The consequence from a member of the public making contact with the live conductor on the ground is considered to be **Catastrophic**, with a potential for electrocution.

In the event of HV & ST conductors, we expect that due to fault current, protection schemes will operate in the majority of cases and therefore the likelihood of this outcome is considered to be **Rare**.

*The untreated risk rating is therefore assessed to be **Significant** (as per Table 1, Risk Matrix).*

Due to the catastrophic nature of the consequence of this risk, JENs duty to reduce the risk to any person should be minimised as far as practicable.

2. Fire start due to asset failure caused by vegetation contact from outside of the clearance space (Hazard Tree)

From 2021-2024 there were 6 incidents of fire starts due to contact from tree branches outside of the clearance space (Hazard Trees).

As urban feeders are located in the LBRA network region, the consequence from a fire start is considered **Serious** due to the potential for temporary harm to the environment, containment to a small area and usually some loss of or damage to third party property.

The likelihood of a fire start incident occurring is **Almost Certain**, as it is expected to occur once (or more) within 1 year.

*The untreated risk rating is therefore assessed to be **High** (as per Figure 1 - Risk Matrix).*

If left untreated this key risk presents an unacceptable liability in JENs duty to reduce the risk to any person, property as far as practicable.

2.4.2.1 Hazard Controls

The following four options have been identified to minimise the risks described above.

Do Nothing

Continue to implement existing controls to the risks posed by Hazard Trees by using:

- Hazard Trees identified through the Electric Line Clearance assessment program by a **Vegetation Assessor** (not Arborist) – control deemed to be inadequate based on no. of fault occurrences over last 4 year period.
- Ad-hoc identification of hazardous vegetation by members of the public or JEN employees – control's effectiveness is low.
- Rely on existing protection schemes to isolate power to fallen wires and make the wire safe to touch – control does not always mitigate the potential consequence.

Underground all HV and ST Adjacent to Hazard Trees

This option involves converting existing overhead electric line spans that are at risk from Hazard Trees to underground, eliminating the risk for identified Hazard Trees contacting electric lines. This measure would be incredibly expensive relative to the other options proposed and would still require ongoing assessment unless the entire network was converted to underground as detailed in 3.3 – 'Options analysis' below.

Combination of various network design solutions

This option involves using a combination of measures, including:

- Rerouting overhead lines – Rerouting lines is limited by geography and the presence of alternative paths without Hazard Trees. This option would mitigate the risk posed by Hazard Trees but is estimated to only be appropriate in 20% of scenarios in LBRA. This control would need to be managed by regular inspection on an ongoing basis due to continued tree growth.

- Installing offset crossarms – Offset crossarms can provide additional estimated (3-4m) horizontal clearance from Hazard Trees. This control is of limited effectiveness and is only suitable in certain scenarios where design permits. For this control to be effective this Hazard Trees would still need to be assessed on an ongoing basis due to tree growth.

- Installing covered conductor to protect electric lines from Hazard Trees – Covered conductor for HV and ST is a non-preferred option used only when all other options are exhausted. This is due to additional safety implications with respect to reduced fault visibility for protection operation (due to the additional resistance between ground and conductor causing reduced fault current). Consequently, a live conductor could sit on the ground energised without protection operating increasing the public safety risk. Covered

conductor does not reduce the likelihood of a Hazard Tree bringing down a line, but may be seen to mitigate the risk of consequence. This option would only be used as a measure of last resort.

Hire a dedicated arborist and initiate LBRA Hazard Tree Management Program (Recommended Option)

Identification and cutting of trees that are likely to fall in such a way that part or all of the tree will fall onto an electric line and cause damage. This control will identify and treat the risk posed by a Hazard Tree minimising the likelihood of occurrence. It's estimated that a dedicated program can reduce the impact of contact Hazard Tree vegetation by 70% based on the effectiveness of the existing HBRA program. The timeframe to implement the treatment (cutting) following the identification (assessment) of Hazard Trees can be very short so the benefits would be realised quite quickly compared to options requiring engineering solutions.

2.5 Project Objectives and Assessment Criteria

2.5.1 Project objective

Under The Electricity Safety Act, s98, the general duty of major electricity companies, including JEN is to apply additional controls to minimise safety risks as far as reasonably practicable (see section 1.3). The measure proposed in this business case is cost effective compared to the hazard reduction associated with vegetation coming into contact with and damaging electric lines and relative to the other options considered. This measure also improves the operational safety of the JEN network when considering the risk that large trees pose to electricity distribution. This will also carry the added benefit of improved equipment, the public and operational personnel. Under the AFAP principal JEN has an obligation to mitigate the hazard posed by Hazard Trees as far as practicable.

2.6 Consistency with Jemena Strategy and Plans

JEN prides itself on an exemplary safety record. Our strategy includes the principle to "deliver safe, reliable, affordable energy and sustainable performance for all". Jemena Electricity Distribution Asset Class Strategy [14] contains an Operational Excellence directive that in part mandates the management of assets in a safe manner. The preferred option to implement a Hazard Trees Management Program in the LBRA is consistent with JEN's strategy and plans and legal obligations, as discussed in the previous section.

[14] ELE-999-PA-IN-007 Electricity Distribution Asset Class Strategy

3. Credible Options

3.1 Identifying Credible Options

The following credible options could be executed to address the risks posed by Hazard Trees upon electric lines in LBRA regions of the Jemena electricity distribution system:

1. **Option 1:** Do nothing.
2. **Option 2:** Underground HV and ST adjacent to Hazard Trees.
3. **Option 3:** Reroute line, offset crossarms and apply covered conductor to HV and ST adjacent to Hazard Trees
4. **Option 4:** Hire an arborist and implement LBRA Hazard Tree Management Program (Preferred Option).

3.2 Developing Credible Options

Error! Reference source not found. Table 3-1 shows the extent to which each option addresses the identified issues.

Table 3-1: Effectiveness of Options

Issue	Option 1 Do Nothing	Option 2 Reroute Underground	Option 3 Reroute Above Ground, Offset Crossarms and Covered Conductor	Option 4 Hire Arborist and Implement LBRA Hazard Tree Management Program
Issue 1 Reduction of Risk of Electrocution	○	●	◑	●
Issue 2 Fire starts	○	●	◑	●
Issue 3 Maintaining Network Reliability	○	●	◑	●
Issue 4 Hazard Tree Assessment	○	◑	◑	●
Issue 5 Cost analysis	◑	○	○	●
Issue 5 NPV analysis	N/A	○	○	●

●	Fully addressed the issue
◑	Partially addressed the issue
○	Did not address the issue

3.3 Options analysis

The affected JEN assets

In the LBRA, assets within scope which are affected by Hazard Trees include:

- 36,133 HV and ST spans
- Of which, 16,508 HV and ST are vegetated spans
- 20% of vegetated spans are estimated to have Hazard Trees present *(based upon field observations by the **Vegetation Management Program Leader** and **HBRA Hazard Tree Program Arborist**)*
- 70% of the Hazard Trees are JEN's responsibility for management (with the remaining 30% of Hazard Tree management being a Council responsibility to manage)

Using the above data it's estimated that there will be in the order of 600 Hazard Tree spans identified across the 5 year period.

3.3.1 Option 1: Do Nothing

This option involves accepting the risk posed by Hazard Trees in the LBRA under existing measures. JEN will continue with existing controls and processes without implementation of any additional measures or change and accept the increasing safety risk posed by Hazard Trees with increased frequency of significant weather events and the greening of Melbourne. This approach carries the benefit of slightly reduced operational expenditure but also poses unacceptable risk.

Approach

Maintain existing measures through routine Vegetation Management Program and ad hoc identification of Hazard Trees.

Impact on Safety

The current level status quo. Risk to operational network safety performance remains with gradually worsening outcomes increasing due to increased tree growth and heightened, more severe and frequent weather events.

Issues

Continued presence of incidents caused by problematic Hazard Trees due to insufficient detection with current controls.

Cost Analysis

We are currently experiencing an average of 80 faults per year due to contact from Hazard Tree vegetation as per Section 2.2.1.

With outcomes from incidents ranging from fault location and restoration of supply to customers, to asset damage requiring repair, to significant property damage in some cases the remediation cost (including 3rd party damage claim cost) for each fault sustained is estimated to be approximately $5k on average,

Remediation is therefore evaluated at $400k operating cost per year.

With aforementioned factors increasing the future likelihood and consequence it's estimate remediation cost to increase by 7.5% per year without treatment.

$2024	Costs
Faults	80
Average cost of remediation (per span)	$5k

$2024	Costs
Total cost	$400k (+7.5% /year)

Table 3-2: Option 1: Total costs across regulatory period

$2024	RY26/27	RY27/28	RY28/29	RY29/30	RY30/31
Opex	400k	430k	462k	497	534k
Capex	0	0	0	0	0
Total	400k	430k	462k	497	534k

Outcome

Heightened risk of damage to assets & property, risk to the public via fire starts & electrocution due to increased failure of Hazard Trees associated with increasingly severe weather and increased presence of Hazard Trees as vegetation grow in Melbourne.

Due to ongoing and increasing remediation costs and no change in outcome, the Net Present Value (NPV) is considered low.

3.3.2 Option 2: Underground HV and ST Adjacent to Hazard Trees

This option involves rerouting overhead electric line spans that are at risk from Hazard Trees to underground. This approach would be more expensive compared to the other options and would still require the effective identification of Hazard Trees throughout overhead parts of the network through an arborist's full network assessment. This would also be an ongoing process unless the entire network was undergrounded.

Approach

Begin by targeting zone substation areas with a higher occurrence of faults (see Table) due to vegetation contact (from outside of the clearance space) such as North Heidelberg, Heidelberg and Airport West. Undergrounding of network would likely occur in ad hoc fashion leading to inefficient conversion of overhead electricity distribution to underground.

Impact on Safety

There would be significantly improved operational network safety as underground lines would not be impacted by Hazard Trees.

Issues

- Considerably more expensive compared to the other options
- Ongoing requirement to undergrounding sections of the network
- Arborist still required to assess the remaining overhead electric line spans.

Cost Analysis

Despite costs involved in cutting Hazard Trees being eliminated, an arborist regularly assessing the network is still required. Additionally, there will be further costs related to undergrounding electric line spans.

FTE arborist salary is based on industry standard in line with existing roles that are occupied.

$2024	Costs
FTE Arborist	$70k/year (@50% utilisation)

The assumed costs related to undergrounding cables are $2-3k per metre, noting that typical span length is 50m.

$2024	Costs
Underground cable costs (depending on road type, ground type etc.)	$2-3k per metre

The installation costs for cable head poles are assumed to be $50k per cable head pole.

$2024	Costs
Cable head pole installation	$50k per cable head pole

Finally, the costs related to design and surveying are assumed to be $20k.

$2024	Costs
Design / Survey costs	$20k

The average cost per span is approximately $250-300k.

Cost applied to the entire network are outlined below:

$2024	Costs
Total spans	600
Treatment rate per span	$250k
Total cost	$140M-150M

The assumption of total costs for the whole regulatory period have been set out below:

Table 3-3: Option 2: Total costs across regulatory period

$2024	RY26/27	RY27/28	RY28/29	RY29/30	RY30/31
Opex	$70k	$70k	$70k	$70k	$70k
Capex	$30,000k	$30,000k	$30,000k	$30,000k	$30,000k
Total	**$30,070k**	**$30,070k**	**$30,070k**	**$30,070k**	**$30,070k**

At a total cost of over $150M ($2024) for the next regulatory period, this option is prohibitively expensive relative to other options being considered. This represents extremely low Net Present Value (NPV) due to the scale of investment required.

Outcome

Proceeding with this option would result in substantially improved network safety outcomes due to the elimination of identified risk posed by Hazard Trees.

3.3.3 Option 3: Reroute Line, Offset Crossarms, Apply Covered Conductor to HV and ST adjacent to Hazard Trees

Using a combination of measures, being rerouting lines, offset crossarms, and, as a last resort, applying covered conductor to protect electric lines from Hazard Trees where the former two measures are deemed to be not viable. This approach would also be expensive and would also require the effective identification of Hazard Trees throughout the network by an arborist. Some areas of the network would not be suitable for any of these treatments which would limit the effectiveness of this option. This approach would require ongoing management due to growth of trees.

Rerouting lines is limited by geography and is very costly. This approach would likely only be possible in less densely populated areas and trees often encroach on both sides of road. Due to these limitations, it is estimated to be appropriate in 20% of Hazard Tree situations.

Offset crossarms can provide an additional estimated (3-4m) horizontal clearance from private street trees. This does not eliminate the risk but mitigates it as trees may grow into the hazard space again. Due to design and geographical constraints, this approach is estimated to be available to be used and appropriate in approximately 20% of Hazard Tree situations.

Covered conductor is a non-preferred option used only by exception when all other options are exhausted because of other consequential impacts where insulated cables may not cause sufficient fault current for the protection system to detect the fault. Additionally, a fault involving conductor contact with the ground or with trees would have increased electrical resistance due to the cable insulation which would result in reduced fault current. Hence, for insulated cable, there is an increased likelihood of energised conductor laying on the ground, potentially exacerbating risks rather than mitigating them. In addition, covered conductor does not remove the likelihood of a Hazard Tree bringing down lines.

Approach

For 600 spans across the network identified to contain Hazard Trees its estimated 120 spans could be rerouted & another 120 spans could have offset crossarms installed to mitigate risk. Given potentially lengthy lead times for construction works to take place, prioritisation would take place by targeting zone substation areas with a higher rates of faults due to vegetation contact (originating outside of the clearance space) such as North Heidelberg, Heidelberg & Airport West to achieve greatest effect. Inspection program would need to be ongoing due to growth of trees.

Impact on Safety

Re-routing lines removes risk associated with proximity to a Hazard Tree by removing the line and reconstructing it away from the Hazard Tree. Offsetting crossarms reduces risk of contact by increasing the clearance of the line from an adjacent Hazard Tree. Covering conductor (in exceptional circumstances) reduces risks associated with contact by Hazard Trees but does not reduce the risk for conductors on ground. Protection systems are less likely to operate when covered conductor is on the ground, leading to an increase in the risk of them remaining live and, as such, increases the possibility for risk of electrocution.

Issues

- Considerably expensive options (see below cost analysis)
- Ongoing risks, even if treatment is applied to the entire network
- Trees may grow so large that previously applied measures might be ineffective
- An arborist still required to assess the remaining overhead electric line spans.

Cost Analysis

Despite costs involved in cutting Hazard Trees is eliminated, an arborist is still required.

FTE arborist salary is based on industry standard in line with existing roles that are occupied.

$2024	Costs
FTE Arborist	$70k/year (@50% utilisation)

The indicative costs associated with re-routing lines are set out below, 2 bays minimum per Hazard Tree is assumed due to deviation of line. Re-routing lines could be utilised for approximately 20% of Hazard Tree cases.

$2024	Costs
Installation of 2 new poles	$50k per pole
Replacement of 2 existing poles	$50k per pole
Design / Survey costs	$20k
Total cost	~$220k

Most commonly 3 consecutive crossarms (2 bays) are required due to design constraints. Offset crossarms could be utilised for approximately 20% of Hazard Tree cases, with indicative costs set out below:

$2024	Costs
Crossarm costs	$10k per crossarm
Design costs	$5k
Total cost	~$35k (2 bays)

Finally, covered conductors would be utilised when all other options are exhausted, and are applied rarely due to safety issues as a result of the possibility of reduced efficacy of protection systems. However, the assumed costs for permitted installation are set out below:

$2024	Costs
Covered Conductor costs	$30k per span

The assumption of costs applied to the entire network are outlined below:

$2024	Costs
Total spans	600
Treatment rate per span	
- Reroute lines	120 spans (20%) – 120 x $220k = $26.4M
- Offset crossarms	120 spans (20%) – 120 x $35k = $4.2M
- Covered Conductor	0 spans (by exception only)
Total cost	$30.6M (addresses 40% of the hazard spans)

Remediation

In line with Option 1, the no. of faults requiring remediation caused by Hazard Trees was 80 without treatment.

Noting that Option 3 addresses estimated 40% of spans via reconstruction, under the assumption that the remaining 60% of spans are not treated, no. of faults expected to trend downwards towards 48 per year.

Increased likelihood and consequence estimated to increase remediation cost by 7.5% per year.

$2024	Costs
Faults	48
Average cost of remediation (per span)	$5k
Total cost	$240k (+7.5% /year)

The projection for total costs for the next regulatory period have been set out below:

Table 3-4: Option 3: Total costs across regulatory period

$2024	RY26/27	RY27/28	RY28/29	RY29/30	RY30/31
Opex	$310k	$328k	$347k	$368k	$391k
Capex	$6,120k	$6,120k	$6,120k	$6,120k	$6,120k
Total	$6,430k	$6,448k	$6,467k	$6,488k	$6,511k

Outcome

This option would result in an incremental improvement to safety dependent upon expenditure in the program. The results would not be immediate, and expenditure would be ongoing. Some areas would not be suitable for this approach and would suffer from continued impact upon safety and reliability due to Hazard Trees. This approach would still require hire of an arborist as tree growth would require ongoing assessment. Due to the effectiveness of this option (40% network treated only) and the significant outlay across the regulatory period, the NPV is considered very low.

3.3.4 Option 4: Hire Arborist and Implement LBRA Hazard Tree Management Program

This option comprises hiring a dedicated arborist to identify Hazard Trees in all LBRA areas for HV and ST electric lines and manage the cutting of identified Hazard Trees. This measure is the most cost effective and it provides ongoing protection to areas of the network where trees might grow sufficiently large as to become new Hazard Trees and can be deployed much more quickly across a larger portion of the LBRA than the other credible options being considered.

Approach

Inspect the entire LBRA network on a two-year rotation. Where Hazard Trees are identified, organise trimming and cutting. Reducing the risk high risk Hazard Trees could be actioned more quickly under this option as trimming and cutting can be completed rather than lengthy reconstruction of the network.

Impact on safety

This option results in a more timely treatment of the risk of Hazard Tree due to the cutting being conducted more immediately after identification than any engineering solution. This option is estimated to reduce the no. of events from Hazard Trees contacting electrical assets by 70%. As a result, there is a significant and timely reduction in public safety and fire starts risk.

Issues

Possible resistance by some customers and councils to cutting trees, however historically engagement with those expressing concerns have proved possible with all trees that have required cutting. The JEN Customer Resolution is very experienced in resolving these matters. In our experience public attitudes to tree cutting are known to vary greatly over time and we respond dynamically to these.

Cost Analysis

See further detail in Cost Estimation Analysis (Cost Estimation AnalysisAppendix A)

$2024	Costs
FTE Arborist	$140k/year

The estimated costs related to cyclical cutting are assumed to be the following:

$2024	Costs
Cutting costs	$360k/year (120 spans/year x $3,000/span)

Further breakdown of cost estimation can be found in Appendix A - Cost Estimation Analysis.

Remediation Costs

It's estimated this option will reduce the risk of occurrence by 70%, reducing the expected no. of faults to 24 per year on average.

Increased likelihood and consequence is estimated to increase remediation cost by 7.5% per year.

$2024	Costs
Faults	24
Average cost of remediation (per span)	$5k
Total cost	$120k (+7.5% /year)

The assumption of total costs for the whole regulatory period have been set out below:

Table 3-5: Option 4: Total costs across regulatory period

$2024	RY26/27	RY27/28	RY28/29	RY29/30	RY30/31
Opex	$620k	$629k	$639k	$649k	$660k
Capex	$0	$0	$0	$0	$0
Total	$620k	$629k	$639k	$649k	$660k

Outcome

This option is estimated to mitigate the impact of faults due to contact by Hazard Trees by 70% based on HBRA program results which results in substantially improved safety of the network due to significantly reduced risk of impact of Hazard Trees upon power lines and electricity distribution infrastructure. This option offers high NPV given its estimated effectiveness in reduction of risk and relative cost compared to alternative options

4. Recommendation

Given that tree growth would require ongoing assessment, the arborist would be hired on a perpetual basis.It is recommended that Option 4 be adopted. It is practicable to hire a suitably qualified arborist to conduct an ongoing Hazard Tree Program in the JEN LBRA to identify, manage and treat Hazard Trees in order to reduce the risk to public safety that is posed. This program should be managed on an ongoing basis given the changing nature of the profile of vegetation near electricity assets which poses a very real safety risk.

As an operator, it is our duty to minimise risks as far as practicable to the safety of any person, damage to the property and the bushfire danger arising from the supply network

This option maximises the net present value (NPV) to JEN customers where alternative options cannot be justified financially and addresses the identified key risks and issues mitigating the likelihood of electrocution from live assets and the risk of fire start resulting in damage, whilst also maintaining the reliability of customer supply.

The business case proposes a total incremental operating expenditure of $500k per annum ongoing throughout the next regulatory period to implement a dedicated LBRA Hazard Tree Management Program on the basis that improving public safety by minimising the risk of incidence of contact from fallen vegetation on to High Voltage and Sub Transmission electric lines resulting in live conductors on the ground and fire starts. The business case proposes a total incremental operating expenditure of $500k per annum ongoing throughout the next regulatory period to implement a dedicated LBRA Hazard Tree Management Program on the basis that improving public safety by reducing the risk of contact from fallen vegetation on to High Voltage and Sub Transmission electric lines. This option has been demonstrated as feasible to implement from a financial and operational perspective whilst achieving effective safety outcomes by minimising risk as far as practicable.

Appendix A
Cost Estimation Analysis

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A1. Cost Estimation Analysis

The following cost estimates have been informed by existing network data and Hazard Tree Management Program evidence.

Table 4-1: Program Elements

Elements	Parameters	Justification
Inspection Program		
Inspection Cycle	2 years	Nominated based on proposed resource, estimated effort and effective implementation of program in HBRA.
Scope limited to HV & ST electric lines only	36,133 spans	Actual number of HV or ST poles - from Vegetation Management System (**VMS**).
HV and ST spans in LBRA containing vegetation	16,508 spans	Actual number of vegetated spans in LBRA - from VMS.
Estimated number of Hazard Trees per vegetated span	0.2 (1 per 5 spans)	Estimation - in consultation with Vegetation Management Program Leader and HBRA Hazard Tree Management Program Arborist based on their observations in the field.
The proportion of Hazard Trees JEN is responsible to manage (as opposed to 3rd party responsible)	70%	Estimation - in consultation with Vegetation Management Program Leader – Council responsible trees are less likely to present as Hazard Trees based on their location with relation to power lines (usually located underneath or beside electric lines). Council responsible trees are more likely to be managed within the clearance space before becoming Hazard Trees. Private trees growing outside the clearance space are more likely to become Hazard Trees and overhang/ line of fall outside the clearance space.
The proportion of Hazard Trees found requiring cutting within program cycle by JEN	25%	Estimation – in consultation with HBRA Hazard Tree Management Program Arborist based on existing criteria developed in the HBRA. It was identified through the HBRA program that early identification and monitoring of Hazard Trees is the most effective way to manage these trees. Not all trees meet the criteria for cutting/removal, but their condition is actively monitored by the Hazard Tree arborist.
Cutting Program		
Average cost of cutting per span	$3,000	Estimation based on average cost experienced by the network to clear trees via shutdowns, live-line glove and barrier restrictions or cutting contractor (EWP/climbing) options.

A2. Program Management, Assessment and Auditing

One (1) suitably qualified Arborist to be dedicated to the Program as a full-time resource on a permanent employment basis undertaking the following activities.

Table 4-2: Breakdown of Resource Activities

Activity	FTE	Estimated operating expenditure per annum ($k, $2024)
Assessment – Identify & Categorise	0.35	49
Assessment – Detailed Assessment	0.15	21
Notification – Customer	0.05	7
Consultation – Customer	0.10	14
Consultation & Reporting – Council	0.05	7
Managing Program	0.10	14
Coordinating Cutting Program - Live Line and Planned Outages	0.15	21
Auditing of Cutting	0.05	7
Total	**1.00**	**140**

A2.1 Cutting Program

Trees overhanging or in close proximity to the ST and HV conductors will often require a planned outage of the network in order to allow the cutting work to be performed safely. The benefit of this approach is that multiple trees can be cut during a single planned outage.

Alternatively, in some cases Hazard Trees may be cut using Live Line techniques performed by Glove and Barrier trained Linesman or if there is suitable clearance from the lines, network endorsed cutting contractors may be utilised to cut Hazard Trees safely.

Taking into consideration the various methods of cutting available depending on the circumstances, it was determined that a reasonable average cost estimate for the cutting of each span is $3,000.

Considering Hazard Trees found across the JEN network that will be actionable by cutting in each cycle of the program, the total cost of cutting is forecast to be $360k per annum (120 spans per annum x $3,000 per span).

A3. Program Expenditure

The annual operating expenditure in the Hazard Tree Management Program in the LBRA is as follows:

Table 4-3: Program Operating Expenditure

Program Component	Estimated operating expenditure per annum ($k, $2024)
Program Management, Assessment and Auditing	140
Program Cutting	360
Total	**500**

Appendix B
Regulatory Obligations

B1. Electric Safety (Electric Line Clearance) Regulations 2020

9 Responsible person may cut or remove Hazard Tree

(1) This clause applies to a responsible person referred to in section 84, 84C or 84D of the Act.

(2) The responsible person may cut or remove a tree for which the person has clearance responsibilities

if a suitably qualified arborist has—

(a) assessed the tree having regard to foreseeable local conditions; and

(b) advised the responsible person that the tree, or any part of the tree, is likely to fall onto or otherwise come into contact with an electric line.

Note

Under section 86B of the Act a Council, in a municipal fire prevention plan, must specify procedures and criteria for the identification of trees that are likely to fall onto, or come into contact with, an electric line, and procedures for the notification of responsible persons of trees that are Hazard Trees in relation to electric lines for which they are responsible.

(3) For the purposes of this clause it is irrelevant that the tree is not within, and is not likely to grow into, the minimum clearance space for an electric line span.

B2. Electricity Safety Act, s83B

The general duty of specified operators, including Jemena, is to minimise bushfire danger.

(1) A specified operator must design, construct, operate, maintain and decommission an at-risk electric line to minimise as far as practicable the bushfire danger arising from that line.

B3. The Electricity Safety Act, s98

The general duty of major electricity companies, including Jemena is to minimise safety risks.

Duties of the Electricity Safety Act 1998 (ESA) which requires a Major Electricity Company (MEC) to design, construct, operate, maintain and decommission its supply network to minimise As Far As Practicable (AFAP) the hazards and risks to the safety of any person, damage to the property and the bushfire danger arising from the supply network.

B4. National Electricity Rules (NER)

Considerations regarding the operating expenditure objectives set out in the NER (clause 6.5.6) are particularly relevant to JEN's expenditure decisions:

a) *A building block proposal must include the total forecast operating expenditure for the relevant regulatory control period which the Distribution Network Service Provider considers is required in order to achieve each of the following (the operating expenditure objectives):*

   (1) *Meet or manage the expected demand for standard control services over that period*

   (2) *Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services*

(3) To the extent that there is no applicable regulatory obligation or requirement in relation to:

(i) The quality, reliability or security of supply of standard control services; or

(ii) The reliability or security of the distribution system through the supply of standard control services,

to the relevant extent:

(iii) Maintain the quality, reliability and security of supply of standard control services

(iv) Maintain the reliability and security of the distribution system through the supply of standard control services.

(4) Maintain the safety of the distribution system through the supply of standard control services.

B5. Victorian Electricity Distribution Code of Practice

Additionally, the Victorian Electricity Distribution Code of Practice (**EDCoP**) sets out provisions relevant to JEN's planning, design, maintenance, and operation of its network, most relevantly section 19.2 (Good Asset Management) and section 13.3 (Reliability of Supply):

Section 19.2 **– Good Asset Management**

A distributor must use best endeavours to:

a) Assess and record the nature, location, condition and performance of its distribution system assets

b) Develop and implement plans for the acquisition, creation, maintenance, operation, refurbishment, repair and disposal of its distribution system assets and plans for the establishment and augmentation of transmission connections:

- *To comply with the laws and other performance obligations which apply to the provision of distribution services including those contained in this Code*
- *To minimise the risks associated with the failure or reduced performance of assets*
- *In a way which minimises costs to customers taking into account distribution losses.*

c) Develop, test or simulate and implement contingency plans (including where relevant plans to strengthen the security of supply) to deal with events which have a low probability of occurring, but are realistic and would have a substantial impact on customers.

Section 13.3 – Reliability of Supply

A distributor must use best endeavours to meet targets determined by the AER in the current distribution determination and targets published under clause 13.2.1 and otherwise meet reasonable customer expectations of reliability of supply.