Jemena Electricity Networks (Vic) Ltd

2026-31 Electricity Distribution Price Review - Revised Regulatory Proposal

Supporting justification document

Compliance Switchgear Replacement - Business Case

Public—1 December 2025

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1. Executive Summary

Key highlights

- This program is required to mitigate risk of switchgear failure on the Jemena Electricity Networks (JEN). Particularly, several distribution substations (DSS) with kiosk structures having deteriorated due to corrosion, unstable frames and aging enclosures.
    - These substations contain Schneider RMU Type 2 switchgear with no SF_6 gas gauge and are tagged as Caution Regarding Operation (CRO).
    - The risks which exist with these assets, in addition to general switchgear risk, include arc flash, fire, and other safety risks. The combination of structural and operational issues increases the likelihood of asset failure and expands outage impact zones.
- ILJIN and HV overhead GFB switches are suffering from galvanic corrosion of the low gas lockout mechanism failure.
- Our approach has identified a prudent, cost-effective program of proactive replacements to ensure that we replace the most at-risk defective assets, to maintain network performance and address JEN compliance requirements.
- Our program involves replacing 36 Schneider Type 2 RMUs, which includes 35 DSS kiosks and one indoor RMU, with JEN standard solutions.
- Our program involves replacing 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches
- The replacement program recommends completion by 30 June 2031, with an estimated total capital expenditure of $10.92M ($2024).

1.1 Purpose

This document provides the business case to implement overhead line switchgear replacement activities during the 2026-31 regulatory control period. The proposed program, with a total capital expenditure of $10.92M, is part of our forecast replacement capital expenditure.

1.2 Identified need

The key issues associated with JEN switchgear assets, more broadly, are failure to operate, failure to carry load, overheating, insultation breakdown, hardware mechanical failure, failure to external factors and failure due to operational errors or by third parties.

JEN has also identified a group of aged distribution substations equipped with Schneider Merlin Gerin Type 2 RMUs that present unacceptable safety, reliability and environmental risks. These RMUs lack SF_6 gas monitoring and are tagged with CRO, which prohibits live switching and increases outage impact zones.

Field inspections have confirmed structural deterioration, including corrosion and unstable frames, which pose risks to crews and the public. Continued operation of these assets increases the likelihood of arc flash, fire, and environmental impacts, and limits JEN's ability to respond efficiently to faults.

The known issues with relevant switchgear are described below:

Issue	Description of Issues

Commented [SM1]: @George Tziokas , to assist the AER I suggest we add here the specific projects (from the capex model) this BC cover. I think ILJIN is clear, but what are the other projects that make up the $10.9M?

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Have included:
- Our program involves replacing 36 Schneider Type 2 RMUs, which includes 35 DSS kiosks and one indoor RMU, with JEN standard solutions.
- Our program involves replacing 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches

1	**General asset class risk** - The key issues associated with overhead line switchgear are failure to operate, failure to carry load, overheating, insultation breakdown, hardware mechanical failure, failure due to external factors and failure due to operational errors or by third parties.
2	**RMU asset risk -** The risks which exist with these assets, in addition to the general switchgear asset class risk, includes arc flash, fire, and other safety risks. The combination of structural and operational issues increases the likelihood of asset failure and expands outage impact zones on the JEN network.
3	**Regulatory risk** – JEN has a duty to minimise safety risks with regard to the design, construction, operation, maintenance and decommissioning of the network to minimise hazards and risks to the safety of any person and damage to property. JEN also must meet reliability of supply obligations. This replacement program identifies likely programs of work to maintain network performance and meet compliance obligations upon asset failure.

JEN also recognises its responsibility to act prudently and efficiently when investing in the distribution network to meet customer and community needs. One way we do this is by adopting asset management practices that put controls in place to test the investment need. Our best practice asset management activities involve balancing costs, opportunities and risks against performance.

Our program involves replacing 36 Schneider Type 2 RMUs, which includes 35 DSS kiosks and one indoor RMU, with JEN standard solutions.

Our program involves replacing 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches

In preparing our proposed expenditure, we followed capital expenditure objectives that reflect our customers' expectations, the capital expenditure drivers and capital expenditure objectives and criteria contained in the NER. Our objectives are to:

- Meet customers' expectations that we should maintain our current levels of network reliability at the most efficient cost over the long term;
- Meet our customers' expectations that our network and communities are able to withstand and recover from extreme weather events;
- Manage safety, environmental, electrical system and security risks to as low as practicable and comply with all applicable regulatory obligations efficiently over the long term;
- Connect new customers to the electricity network and meet the changing energy needs of existing customers, ensuring we can meet or manage expected demand for all customers; and
- Optimise exports and imports from distributed energy resources and CER to the distribution network.

1.3 Credible options considered

Table 1 sets out the credible replacement options we have considered.

Table 1: Credible options and summary of economic analysis, $2024

Option	Total capital expenditure ($m)	Ranking
Option 1 – Do nothing	-	2

Option	Total capital expenditure ($m)	Ranking
Option 2 – Replace assets to correct safety issues, maintain network performance and reliability and meet compliance obligations	$10.92	1

1.4 Recommendation

It is recommended that Jemena proceed with the replacement of 35 kiosk substations and 1 indoor RMU, under Option 2. These assets have exceeded their design life and pose safety and reliability risks.

This option provides the most operationally viable option to mitigate associated risks, and to maintain the existing performance and reliability of the network. This Option targets the highest-risk assets and provides a practical response to immediate concerns, while laying the foundation for future replacement phases.

Based on this, a forecast investment of $10.92M is required. This option best meets the long-term interests of JEN customers and is consistent with the National Electricity Objective and other regulatory and compliance obligations.

1.5 Regulatory considerations

The objective of the replacement program is to undertake replacement activities to ensure network performance and to meet compliance obligations, to maintain customer supply reliability across the JEN network given the current condition and future risks associated with the relevant switchgear.

JEN's investment decisions are ultimately guided by the National Electricity Objective (NEO). Additionally, JEN is required to meet the requirements of the National Electricity Rules (NER), Victorian Electricity Distribution Code of Practice (EDCoP), and public and industry expectations for distribution system performance, which require capital expenditure objectives to be achieved.

1.6 Financial information

This business case proposes a total capital investment of $10.92M.

This project proposed to be completed by 2031. Table provides the project budget by calendar year.

Table 2: Proposed expenditure by regulatory year, $2024

Regulatory Year	Proposed Expenditure ($M)
2027	$0.59
2028	$1.4
2029	$1.33
2030	$1.3
2031	$1.27
Total proposed expenditure	**$10.92**

2. Identified need

2.1 Business and socio-economic context

The proposed non-routine investment targets substations located in both urban and short-rural areas of the JEN network (for example, Footscray West and Sunbury zones). Each defected distribution substation (DSS) switching zone serves approximately 100 to 400 customers, including life support customers, residential and commercial hubs. These substations are needing to maintain supply reliability, but their current inability to support live switching expands outage impact zones and restoration times.

In practice, what could be a small local interruption ends up cutting power to a larger group of customers. Additionally, some of these DSS kiosks exhibit structural deterioration (corroded frames, weakened enclosures) that has caused equipment misalignment and cable stressing the termination bushings. These physical issues compound the operational limitations and heighten the risk of failures if left unaddressed.

2.2 The identified need and key drivers

2.2.1 Identified need

Most of the Schneider Type 2 Ring Main Units (RMUs) manufactured in the 1980's to early 1990's on the JEN do not have a gas gauge and have had a CRO attached to the equipment and tagged as inoperable. Even where a gas gauge is present, frequent maintenance is required on the switchgear mechanism.

Since RMUs without gas gauges have been tagged as inoperable, isolation is required at the remote end of the switchgear (i.e., a bigger switching zone). As a result, the number of customers affected is increased.

Without a gas gauge, the gas pressure within the switchgear cannot be monitored. The possible low level of gas insulation can lead to insufficient suppression of the arc generated when switching live, posing risk to operators and potentially the general public. In addition, low gas pressure would reduce the Basic Insulation Level (BIL) of the switchgear to withstand overvoltage events potentially leading to catastrophic failure.

Gas insulated switches have been deployed on the network since approximately 1990 in both the manual and remote controlled form. As such the age of the population is quite young with the oldest units at approximately 60% of their expected life. No units will exceed the expected life by 2029.

In October 2022 an incident occurred in which a gas gauge fell from a pole mounted ILJIN 24kV SF6 gas load break switch on the United Energy Network during operation. The incident was caused by corrosion of the aluminium gas gauge. Following this incident, JEN's population of 238 ILJIN switches has been inspected and assessed. It has been identified that over 54% of the JEN ILJIN switches have an aluminium gas gauge showing signs of deterioration. In addition to the corroded gas gauge, some of the ILJIN switches low gas interlocking mechanism have found seized, and not functioning as required due to the build-up of corrosion, dirt and grime during performance testing. Although it has also been noted on other networks that the pressure relief device on the end of the tank is made of aluminium and may be prone to corrosion, this has not been observed on the JEN during inspection. As a result of these defects and the associated safety hazards, a replacement program has been initiated.

2.2.2 Key drivers

2.2.2.1 Asset deterioration and faults

JEN manages the lifecycle of its (non-pole type) distribution substations through sub-asset class strategies and the *Enclosed Substation Inspection Program*.[1] This program covers kiosk, pad mount, indoor, ground, cubicle, and underground substations with inspection intervals based on bushfire risk classification.

[1] JEN MA 0695 Enclosed Distribution Substations Inspection Manual

A review of legacy 22kV kiosk substations equipped with Schneider Merlin Gerin Type 2 RMU switchgear, installed between 1981 and 1999, has identified progressive structural deterioration primarily due to corrosion. The deteriorated structure can result in tilted RMU, which in turn may stress the cable termination bushings, causing them to crack. Such structural compromise impacts the integrity and safe operation of the supported equipment, including switchgear and cable connections.

Most of these switchgear units do not have a gas gauge to monitor SF_6 gas. Without a gas gauge, JEN cannot monitor the insulation level or serviceability of these units. As a result, all affected substations are tagged as CRO and considered inoperable.

In practice, this means any switching involving these units must be done with the section de-energized or isolated elsewhere on the network. The inability to operate the switchgear locally forces operators to switch at the remote (upstream/downstream) end of the feeder to isolate faults. This increases the number of customers impacted during outages, since a larger portion of the network is taken out of service than would be necessary if the local switch could be used to sectionalise. It also elevates the risk of catastrophic failure – where if a fault or surge occurs and an RMU is low on SF_6 the arc may not be properly suppressed, potentially resulting in a violent failure of the unit (explosion or fire) because it cannot withstand the stress.

Additionally, even those units with a gas gauge require regular maintenance on their mechanical components, such as addressing hardened grease in the spring charging mechanisms, which is not a requirement with other modules.

Corrosion of ILJIN gas insulated load break switches - ILJIN gas insulated load break switches have been found to suffer from galvanic corrosion of the low gas lockout mechanism. There are 235 of these switches in service on the distribution network.[2]

See Appendix D & E for further detail.

2.2.2.2 Regulatory compliance

Safety and reliability

Consistent with obligations under National Electricity Objective and JEN's commitment to continuous improvement, JEN is recommending the replacement of overhead switchgear upon failure to ensure network performance, reliability, and to meet compliance obligations.

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.

Investment decisions

In line with the NEO, JEN's investment decisions aim to maximise the NPV to electricity consumers. The objective of this project is to maintain the reliability of supply to customers, given the current condition of the assets. This strategy must align with other JEN strategies and plans, and the project must comply with associated regulatory requirements.

JEN's investment decisions are ultimately guided by the NEO. Additionally, considerations such as the capital expenditure objectives set out in the NER (clause 6.5.7) are particularly relevant to JEN's investment decisions:

> *a) A building block proposal must include the total forecast capital 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 capital expenditure objectives):*

[2] See Appendix A, B and C for supporting detail.

(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.[3]

Additionally, the EDCoP sets out provisions relevant to JEN's planning, design, maintenance, and operation of its network, most notably 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.

When making decisions to invest, JEN must comply with these obligations.

2.2.3 Activities required for non-routine replacement

There are 36 Schneider Type 2 RMUs which have identified inside substations for replacement

[3] NER, cll 6.5.6(a), 6.5.7(a).

- 35 are located inside kiosk substations, and
- One is inside an indoor substation.

These assets are beyond their designed lifespan of 30 years stated by the manufacturer.[4]

Continued operation of these substations increases the risk of safety incidents, environmental harm from SF_6 leaks, and financial costs associated with repairs and outages.

The objective of this project is to replace these defective RMUs which lack integrated gas monitoring equipment. These assets present unacceptable safety and operational risks due to undetected gas loss and structural deterioration. The project aims to:

- Reduce safety risks by eliminating structurally compromised kiosk and mitigating arc flash or fire potential.
- Restore operational flexibility by enabling live switching, thereby improving outage response and reducing customer impact.
- Minimise environmental risks associated with SF_6 by replacing legacy units with current JEN standard kiosk substations. In the case of the indoor substation, the intention is to replace a RMU with a current standard RMU with provision of remote-control function.
- Deliver long-term value to customers by ensuring assets perform to expected standards throughout their lifecycle.

Prioritisation will focus first on structurally compromised kiosks and kiosks with RMU switch operating in a normally open status, followed by those serving critical or high impact customers.

Our proposed expenditure is informed by specific activities, each assigned to service codes (in brackets):

Program & Service Code	Activities
LV Switchgear Replacement (RHF)	Replacement of LV switchgear and all associated hardware, on a singled structure, as a result of: • A fault or operational damage • Erection of new isolators to facilitate network requirements • New LV distribution board • LV Bus • LV fuse switches disconnectors and isolators • Cable extensions, luging and connections • Polycarbonate barriers • LV fuses • Labels signage and locks • Brackets and fittings • Fitting and alterations of all cables and earths • Cut and refit existing or replace trench covers • Electrical inspection as required • Disposal of asbestos including environmental reporting if required • De-commissioning and disposal of defective switchgear The activity excludes: • The installation of ampact stork lugs / connectors

[4] JEN - RP - Support - ELE-999-PR-IN-012 Network Asset Useful Lives Procedure - 20251201 - Public

2.3 Asset risk (or opportunity) analysis

2.3.1 Short description of the affected Jemena assets

The assets in scope include 36 defective distribution substations equipped with legacy Schneider Merlin Gerin Type 2 RMU switchgear, comprising 35 kiosk substations and one indoor unit.

These assets were installed between 1981 and 1999 and are now beyond their designed service life. While the broader population has been assessed, the initial focus is on 12 kiosk substations and one indoor substation located across zones such as Footscray East, Footscray West, Sunbury, Coolaroo and Yarraville. These assets have been identified as having elevated risk profiles based on field inspection data, operational constraints and severity of reliability impact upon failure.

The assets for replacement are set out in Table 3. These are the assets subject to the proposed expenditure in this business case.

Table 3: Asset Replacement List

Item	Substation Name	Feeder	Primary Voltage (kV)	Replacement
1	GREER-NEWELL	FE0-014	22	Kiosk 500kVA
2	JAMIESON-BALLARAT	FE0-014	22	Kiosk 500kVA
3	LINK 31-EXPORT	FW0-006	22	Kiosk 500kVA
4	KIRWAN-ST CLAIR	COO-024	22	Kiosk 500kVA
5	FULLBROOK-LAWRENCE	SBY-023	22	Kiosk 500kVA
6	DYSON-HARCOMBE	SBY-013	22	Kiosk 500kVA
7	PALMER-VIPONT	FE0-014	22	Kiosk 500kVA
8	ANTHONY-OLIVE	SBY-032	22	Kiosk 500kVA
9	BALMORAL-BRAEMAR	SBY-023	22	Kiosk 500kVA
10	DE LISLE-TENNYSON	SBY-023	22	Kiosk 500kVA
11	CARNOUSTIE-GLENEAGLE	SBY-024	22	Kiosk 500kVA
12	NOTREDAME-OXFORD	SBY-024	22	Kiosk 500kVA
13	MARIBYRNONG-NAPIER	YVE-021	22	Standard/remote controllable RMU
14	NORMANBY-MOSSGIEL	COO-022	22	Kiosk 500kVA
15	NORMANBY-BURBRIDGE	COO-022	22	Kiosk 500kVA
16	HADDINGTON-DRUMMOND	COO-022	22	Kiosk 500kVA
17	SPELLMAN-BRENNAN	SHM-021	22	Kiosk 500kVA
18	SORBONNE-CAREY	SBY-024	22	Kiosk 500kVA
19	NORMANBY-CROMWELL	COO-022	22	Kiosk 500kVA
20	NICHOLSON-GREEN VALLEY	BD0-004	22	Kiosk 500kVA
21	WEEMALA-SHANKLAND	BD0-004	22	Kiosk 500kVA
22	FRIENDSHIP-VERONA	SHM-012	22	Kiosk 500kVA
23	HUME-WESTERN RING	CN0-004	22	Kiosk 500kVA
24	ASHLEIGH-GILMOUR	BD0-014	22	Kiosk 500kVA

25	FREEMAN-LIZA	PV0-015	11	Kiosk 500kVA
26	PARINGA-HUDSON	BD0-014	22	Kiosk 1000kVA
27	TRADE PARK 9-TARMAC	AW0-004	22	Kiosk 1000kVA
28	EXPORT 35-LINK	FW0-006	22	Kiosk 500kVA
29	EXPORT-LINK	FW0-006	22	Kiosk 500kVA
30	LINK 37-EXPORT	FW0-006	22	Kiosk 500kVA
31	EXPORT 58-LINK	FW0-006	22	Kiosk 500kVA
32	EXPORT 18-FRANCIS	FW0-006	22	Kiosk 500kVA
33	EXPORT 40-FRANCIS	FW0-006	22	Kiosk 500kVA
34	NOEL-UPPER HEIDELBERG	HB0-021	11	Kiosk 1000kVA
35	SANTA MONICA-LAGUNA	SA0-006	22	Kiosk 500kVA
36	BRECON-YARCOMBE	ST0-032	22	Kiosk 500kVA

The units within these substations are gas-insulated switchgear designed to perform load break switching within JEN's high-voltage distribution network. Their role includes load switching and fault isolation with fault direction indication from the fault passage indicator.

Over time, exposure to environmental conditions has contributed to structural deterioration, particularly corrosion affecting support structures and panels. Most units lack integrated SF_6 gas gauges, these affected substations are tagged as CRO, restricting live switching and increasing operational complexity. In additional, it poses the potential risk of equipment failure during overvoltage events.

In October 2022 an incident occurred in which a gas gauge fell from a pole mounted ILJIN 24kV SF6 gas load break switch on the United Energy Network during operation. The incident was caused by corrosion of the aluminium gas gauge. Following this incident, JEN's population of 238 ILJIN switches has been inspected and assessed. It has been identified that over 54% of the JEN ILJIN switches have an aluminium gas gauge showing signs of deterioration. In addition to the corroded gas gauge, some of the ILJIN switches low gas interlocking mechanism have found seized, and not functioning as required due to the build-up of corrosion, dirt and grime during performance testing. Although it has also been noted on other networks that the pressure relief device on the end of the tank is made of aluminium and may be prone to corrosion, this has not been observed on the JEN during inspection. As a result of these defects and the associated safety hazards, a replacement program has been initiated.

2.3.2 Asset condition and risk assessment

A qualitative risk assessment was conducted across the full population of 36 substations. The risk assessment is based on field inspections (absence of gas gauge and corroded structure), switchgear normal operation status, and customers impact (switching zone and failure). These inputs provide basis for evaluating asset condition and operational consequences. The results indicate that the risks posed by these assets exceed JEN's defined risk matrix across health and safety, reliability, and environmental domains.[5]

Structural degradation has already compromised mechanical integrity in several units, increasing the likelihood of electrical faults. The absence of SF_6 gas gauges in most RMUs prevents effective monitoring of insulation levels, raising the risk of arc flash or fire during fault events. These conditions present a high likelihood of catastrophic failure and injury to JEN crews, members of the public or damage to third-party property.

Operational limitations due to CRO tagging prevent live switching, forcing remote-end fault isolation and increasing outage scope and duration. This affects a broader segment of customers and reduces JEN's ability to respond efficiently during unplanned events. These extended outages may result in sustained service

[5] See Appendix A for further detail.

interruptions and associated S-factor penalties. Environmental risks also escalate as ageing assets increase the probability of SF_6 leakage, exposing JEN to regulatory consequences and reputational harm.

If no action is taken, the likelihood of catastrophic failure, extended outages, and environmental breaches will continue to escalate. The risks are not tolerable under JENs asset management framework and require treatment to reduce them to acceptable levels.

See Appendix B for further detail on asset conditions.

2.4 Consistency with Jemena strategy and plans

This section describes how this project is consistent with JEN's objectives and strategies:

- **Provision of Service Levels and Reliability:** Ensuring service levels and reliability meet customer expectations.
- **Modern Capabilities:** Deployment of modern equivalent capabilities in the network to remain relevant to customers in the longer term.
- **Prudent and Efficient Expenditure:** Ensuring expenditure is prudent and efficient, aligning with customer expectations regarding affordability.

JEN seeks to ensure that lifecycle costs are both efficient and effective. This business case is consistent with this requirement and aligns with the long-term vision of the network, as set out in the Asset Management Plan (AMP) and annual planning reports.

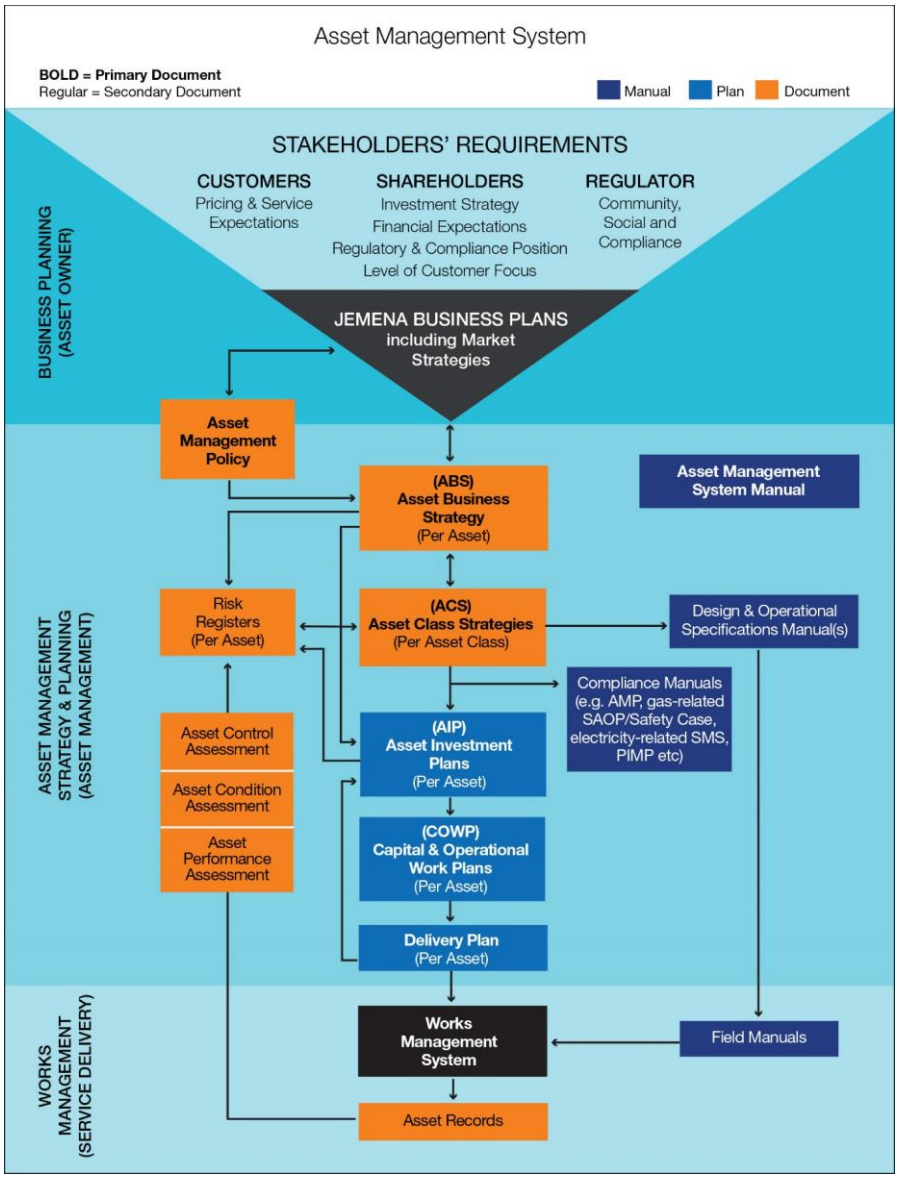
This proposal aligns with Asset Management Strategies, Plans and Policies contributing to a safe workplace for JEN employees and contractors. By addressing identified issues, JEN can reduce the risk of injury or environmental incident.

JEN abides by Australian asset and risk management industry standards (ISO 55001 and ISO 31000:2018) which is part of JEN's internal risk and asset management framework documents (ELE PL 0004 and JAA PO 0050).

Figure 1 outlines the JEN asset management system and where the Asset Management Plan (AMP) is positioned within it. The AMP covers the creation, maintenance and disposal of assets including investment planned to augment network capacity to meet increasing demand and to replace degraded assets to maintain reliability of supply to meet Jemena Business Plan requirements.

This strategic framework facilitates the planning and identification of business needs that require network investment documented via business cases.

Figure 1: The Jemena Asset Management System



JEN also recognises its responsibility to act prudently and efficiently when investing in the distribution network to meet customer and community needs. One way we do this is by adopting asset management practices that put controls in place to test the investment need. Our best practice asset management activities involve balancing costs, opportunities and risks against performance.

In preparing our proposed expenditure, we followed capital expenditure objectives that reflect our customers' expectations, the capital expenditure drivers and capital expenditure objectives and criteria contained in the NER. Our objectives are to:

- Meet customers' expectations that we should maintain our current levels of network reliability at the most efficient cost over the long term;
- Meet our customers' expectations that our network and communities are able to withstand and recover from extreme weather events;
- Manage safety, environmental, electrical system and security risks to as low as practicable and comply with all applicable regulatory obligations efficiently over the long term;
- Connect new customers to the electricity network and meet the changing energy needs of existing customers, ensuring we can meet or manage expected demand for all customers; and
- Optimise exports and imports from distributed energy resources and CER to the distribution network.

This investment also supports Jemena's longer-term goals in the following ways:

- **Health & Safety:** The replacement of structurally compromised distribution substations reduces the likelihood of arc flash, fire, and environmental impacts, protecting field crews, the public, and third-party property.
- **Operational Excellence:** Restoring live switching capability and reducing outage scope improves fault response times and reduces constraints on field and control centre resources. These improvements support SAIFI and SAIDI performance and contribute positively to S-factor outcomes.
- **Reliable and Affordable Energy Services**: By proactively addressing end-of-life asset risks, Jemena reinforces its reputation for delivering safe and reliable energy services. This investment helps maintain customer trust and supports the business's commitment to community safety and service continuity.

3. Comparison of credible options

3.1 Identifying credible options

The following feasible options could be executed to address the business need, problem or opportunity.

1. **Option 1 is 'do nothing'**, which assumes business as usual, to operate the existing defective distribution substations without intervention. While it avoids immediate capital expenditure, it leaves unresolved risks related to asset condition, structural degradation, and switching limitations. This option does not address any of the identified condition issues in full nor does it allow us to maintain current levels of network reliability.
2. **Option 2 is 'Replace high-risk assets to correct safety issues, maintain network performance and reliability and meet compliance obligations'**. This option proposes the replacement of:

    - 35 Schneider Merlin Gerin Type 2 RMUs housed within kiosk substations and one RMU located in an indoor substation.
    - 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches

This option optimises the replacement of defective assets to ensure current levels of network reliability whilst responding to our customers who have indicated they value a stable network. This is evidenced by our customer engagement, which highlights 'maintaining the network' being more important to customers than 'improving the network'. This option addresses the safety concerns as a priority.

3.2 Developing credible options

Table 4 shows the extent to which each option addresses the identified issues.

Table 4: Credible Options Analysis

Issue	Option 1	Option 2
Asset risk The key issues associated with overhead switchgear are failure to operate, failure to carry load, overheating, insultation breakdown, hardware mechanical failure, failure due to external factors and failure due to operational errors or by third parties.	○	●
Particular asset risk The risks which exist with these assets, in addition to general switchgear risk, include arc flash, fire, and other safety risks. The combination of structural and operational issues increases the likelihood of asset failure and expands outage impact zones.	○	●
Regulatory risk JEN has a duty to minimise safety risks with regard to the design, construction, operation, maintenance and decommissioning of the network to minimise hazards and risks to the safety of any person and damage to property. JEN also must meet reliability of supply obligations.	○	●

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

Each of these options are discussed in detail below.

3.2.1 Option 1: Do nothing

This option involves continuing to operate the existing defective distribution substations without intervention. While it avoids immediate capital expenditure, it leaves unresolved risks related to asset condition, structural degradation, and switching limitations. The type 2 RMUs are CRO'd to be inoperable for live switching and lack monitoring capability, while several kiosks show signs of corrosion.

Operational workarounds are in place, but they do not address the underlying issues. It leaves approximately 2,700 JEN customers at risk of supply interruptions unnecessarily due not able to isolate from the immediate switch for planned or unplanned outage for extended period. This option does not align with Jemena's long-term safety and reliability objectives.

The probability of failure for this equipment would continue to increase over time, potentially leading to catastrophic failure while in service. This option also does not address identified safety risks.

Given the criticality of these issues and the lack of risk mitigation, this option is not considered credible.

3.2.2 Option 2: Replace high-risk assets to correct safety issues, maintain network performance and reliability and meet compliance obligations

The 'Replace high-risk assets to correct safety issues, maintain network performance and reliability and meet compliance obligations' option is an approach which invests in the replacement of high-risk switchgear assets to address asset risk and maintain the network at current levels.

This option proposes the replacement of:

- 35 Schneider Merlin Gerin Type 2 RMUs housed within kiosk substations and one RMU located in an indoor substation
- 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches

These assets have been identified as high-risk due to structural deterioration and operational limitations and will be replaced with JEN's current standard kiosk design and current standard RMU with provision of remote control function, respectively.

Option 2 offers a practical and proportionate response to critical safety and reliability concerns, while establishing a foundation for future replacements that will address future defective substations.

This option would also maintain current levels of network reliability and optimises replacement levels to maintain this reliability whilst responding to our customers who have indicated they value a stable network more so than improvements to the network. This is evidenced by our customer engagement, which highlights 'maintaining the network' being more important to customers than 'improving the network'.[6] Jemena's Peoples Panel noted 'Jemena needs to prioritise investing in reliability by assessing, building, and maintaining the network to meet changes in operating conditions and withstand network failures'.[7] This position was reiterated by the First Nations and Disability Customer Voice Groups.

This option addresses each of the following identified risks and related impacts:[8]

- **Inoperable RMUs with no gas gauges**, which results in the inability to monitor SF_6 pressure or

[6] See JEN - Att 02-01 Customer engagement – 20250131.

[7] See JEN - Att 02-01 Customer engagement – 20250131, s.5.1.

[8] Option 1 does not address any of these risks.

insulation condition.

- **CRO'd RMUs**, which prohibits live switching, requiring remote isolation and larger outage zones.
- **Structural corrosion in kiosks**, with some requiring temporary supports to prevent collapse.
- **Unknown Basic Insulation Level** (BIL), resulting in an increased risk of equipment failure during overvoltage events.
- **RM6 switch mechanism deterioration**, leading to hardened grease which increases maintenance activity.
- **Potential SF_6 leakage**, leading to environmental harm.
- **Increased customer impact**, as remote isolation expands switching zones during outages.

This option is likely to resolve all identified issues for the high-risk assets while aligning with the JEN asset class and business strategies. The total capital cost of this option is forecasted at $10.92M based on activities commencing in FY2027.

As detailed in this business case, replacements have been identified to ensure that we maintain network performance, reliability and address our compliance requirements. Forecast replacement volumes and expenditure proposed under Option 2 is set out in Table 5.

Table 5: Option 2 Replacement Volumes and Expenditure

Service Code	Activity	Forecast Replacement Volumes					Proposed Expenditure ($2024,'000)					
		FY27	FY28	FY29	FY30	FY31	FY27	FY28	FY29	FY30	FY31	Total
RHF	Distribution S/S switchgear replacement (indoor and ground type)	3.6	8.6	8.2	7.9	7.8	0.49	1.17	1.11	1.08	1.06	**4.9**
RHF	Compact LV boards	3.6	8.28	7.92	7.92	7.56	0.10	0.23	0.22	0.22	0.21	**1.0**
RHG	Replace ILJIN and HV overhead GFB switches	38	-	30	62	62	0.99	-	0.78	1.63	1.63	**5.0**

N.B. Figures have been rounded.

4. Option analysis

This business case proposes two options, being 'do nothing' or the replacement of the defective assets.

The benefits considered in this economic analysis relate solely to mitigating the increasing risk of relevant switchgear failure within the electricity distribution network. This focusses on the safety risks involved with the catastrophic failure of these assets.

Without a gas gauge, the gas pressure within the switchgear cannot be monitored. The possible low level of gas insulation can lead to insufficient suppression of the arc generated when switching live, posing risk to operators and potentially the general public. In addition, low gas pressure would reduce the Basic Insulation Level (BIL) of the switchgear to withstand overvoltage events potentially leading to catastrophic failure.

As a result, all affected substations are tagged as CRO and considered inoperable. In practice, this means any switching involving these units must be done with the section de-energized or isolated elsewhere on the network.

These conditions present a high likelihood of catastrophic failure and injury to JEN crews, members of the public, or damage to third-party property. If no action is taken, the likelihood of catastrophic failure, extended outages, and environmental breaches will continue to escalate. The risks are not tolerable under Jemena's asset management framework and require treatment to reduce them to acceptable levels.

The only feasible option is to undertake replacement of the highest risk assets, at an optimal level informed by our network risk assessment, to address safety risks and meet compliance obligations.[9]

4.1 Financial analysis for the preferred option

4.1.1 Financial analysis

This business case proposes a total capital investment of $10.92M.

This project proposed to be completed by FY31. Table 6 provides the project budget by calendar year.

Table 6: Proposed expenditure by regulatory year, $2024

Regulatory Year	Proposed Expenditure ($M)
FY27	$1.58
FY28	$1.40
FY29	$2.12
FY30	$2.92
FY31	$2.90
Total proposed expenditure	**$10.92**

[9] See Appendix A

5. Recommendation

It is recommended that Jemena proceed with the replacement of:

- 35 Schneider Merlin Gerin Type 2 RMUs housed within kiosk substations and one RMU located in an indoor substation
- 116 gas switches, 340 LV isolators, 750 HV isolators, 30 ACR and a total of 191 ILJIN and HV overhead GFB switches

under Option 2. These assets have exceeded their design life and pose safety and reliability risks.

This option provides the most financially and operationally viable option to mitigate associated risks, and to maintain the existing performance and reliability of the network. This Option targets the highest-risk assets and provides a practical response to immediate concerns, while laying the foundation for future replacement phases.

Based on this, a forecast investment of $10.92M is required. This option best meets the long-term interests of JEN customers and is consistent with the National Electricity Objective and other regulatory and compliance obligations.

Appendix A – Network Risk Assessment

Risk Register

Participants: Piladelak Yindeesap, Catherine lee

S/No	Business Unit	Business Objective Category	Risk type	Risk Title	Risk Description	Root Causes Category	Root Causes - Description (Contributing Factors)	Risk Consequence Category	Risk Consequence - Description	Untreated Consequence	Untreated Likelihood	Untreated Risk Rating	Action Plan	Target Likelihood	Target Risk Rating
1	Jemena Networks - Electricity	Sustainability	Safety risk	mechnical failure of switchgear support structure (4 kiosks)	The DSS kiosk structure shows extensive corrosion. If the frame or panel collapse, it can cause hv connection failure and/or sf6 gas leak.	Resources – Assets, Cash, Equipment, Property	Resources - Corroded switchgear supporting frame due to manufacturer's enclosure material not suitable for Victoria environment.	Health, Safety & Environment	HSE - Risk of arc flash or fire HSE - Potential fatality to worker HSE - Potential shock/injury to general public HSE - SF6 leak to environment	Catastrophic	Almost Certain	Extreme	Replace the DSS kiosk with standard kiosk where structure support is not acceptable	Rare	Low
2	Jemena Networks - Electricity	Sustainability	O-Asset Management	mechnical failure of switchgear support structure (4 kiosks)	The DSS kiosk structure shows extensive corrosion. If the frame or panel collapse, it can cause hv connection failure and/or sf6 gas leak.	Resources – Assets, Cash, Equipment, Property	Resources - Corroded switchgear supporting frame due to manufacturer's enclosure material not suitable for Victoria environment.	Operational	Reliability - Serious customer interuptions due to upstream protection tripped.	Serious	Almost Certain	High	Replace the DSS kiosk with standard kiosk where structure support is not acceptable	Rare	Low
3	Jemena Networks - Electricity	Sustainability	Safety risk	Absence of gas gauge in RMU	The type 2 RM6 doesn't have a built-in gas gauge. Without monitoring capability, gas leak/pressure loss can't be detected, leading to undetected insulation level deterioration. This can cause arc flash during live switching and therefore operation risks.	Resources – Assets, Cash, Equipment, Property	Resources - The original manufacturer design for the Type 2 RM6 model did not include a gas gauge resulting in unknown SF6 gas pressure condition.	Health, Safety & Environment	HSE - Risk of arc flash or fire HSE - Potential fatality to field workers HSE - Potential shock/injury to the general public HSE - Potential exposure to toxic byproducts during clean up after fault. HSE - SF6 leak to environment	Catastrophic	Likely	Extreme	Replace the DSS kiosk with standard kiosk in switchgear that don't have integrated gas Replace indoor switchgear that doesn't have an integrated gas gauge.	Rare	Low
4	Jemena Networks - Electricity	Sustainability	O-Asset Management	Absence of gas gauge in RMU TechAlert - the RM6 has been CRO'd as "inoperable"	The type 2 RM6 doesn't have a built-in gas gauge. Without monitoring capability, gas leak/pressure loss can't be detected, this restricted the RM6 from live operation. As a consquence, more customers would be affected for either plan/unplanned outages.	Process - Policies Procedures, Changes in Management, Operational, Supporting Processes Dependencies	Resources - The original manufacturer design for the Type 2 RM6 model did not include a gas gauge resulting in unknown SF6 gas pressure condition. Process - As per TechAlert, isolation has to be done at the remote end of the switches (Larger switching zone).	Operational	Reliability - Inability to safely perform live switching operation. This means isolation has to be done at the remote end of the switches (Larger switching zone) affecting more customers.	Minor	Almost Certain	Moderate	Replace the DSS kiosk with standard kiosk in switchgear that don't have integrated gas Replace indoor switchgear that doesn't have an integrated gas gauge.	Rare	Low

Risk Register

Participants: Piladelak Yindeesap, Catherine lee

S/No	Business Unit	Business Objective Category	Risk type	Risk Title	Risk Description	Root Causes Category	Root Causes - Description (Contributing Factors)	Risk Consequence Category	Risk Consequence - Description	Untreated Consequence	Untreated Likelihood	Untreated Risk Rating	Action Plan	Target Likelihood	Target Risk Rating
5	Jemena Networks - Electricity	Sustainability	Safety risk	Absence of gas gauge in RMU Unknown status on Basic Insulation Level (BIL)	The type 2 RM6 doesn't have a built-in gas gauge. Without monitoring capability, gas leak/pressure loss can't be detected. Potential insufficent Basic Insulation Level (BIL) under which the switchgear would fail during overvoltage events.	Resources – Assets, Cash, Equipment, Property	External Environment - An overvoltage event may cause flashover or damage between the switch contacts if SF6 gas pressure is insufficient. Normally open switch has higher risk due to doubling of voltage.	Health, Safety & Environment	HSE - Risk of arc flash or fire HSE - Potential fatality to field workers HSE - Potential shock/injury to the general public HSE - Potential exposure to toxic byproducts during clean up after fault.	Catastrophic	Possible	Extreme	Replace the DSS kiosk with standard kiosk in switchgear that don't have integrated gas gauges. Replace indoor switchgear that doesn't have an integrated gas gauge.	Rare	Low
6	Jemena Networks - Electricity	Sustainability	Safety risk	Absence of gas gauge in RMU Unknown status on Basic Insulation Level (BIL)	The type 2 RM6 doesn't have a built-in gas gauge. Without monitoring capability, gas leak/pressure loss can't be detected. Potential insufficent Basic Insulation Level (BIL) under which the switchgear would fail during overvoltage events.	Resources – Assets, Cash, Equipment, Property	External Environment - An overvoltage event (e.g. lightning) may cause flashover or damage between the open contacts (normally open in switchgear) if SF6 gas pressure or level is insufficient.	Financial	HSE with financial implications - Potential costs for repairs, replacements, and 3rd party property damages due to failure. Financial $ between 1M-10M	Serious	Possible	Moderate	Replace the DSS kiosk with standard kiosk in switchgear that don't have integrated gas Replace indoor switchgear that doesn't have an integrated gas gauge.	Rare	Low
7	Jemena Networks - Electricity	Sustainability	Safety risk	Deterioration of RM6 switch mechanism	The RM6 switch mechanism uses a spring for charging and discharging to close or open the contact. Over time, the grease used to lubricate this spring can harden. This hardening causes the spring to become stiff, making it harder to operate, and requiring more force to open or close.	Resources – Assets, Cash, Equipment, Property	Resources -The RM6 spring mechanism became stiff to operate due to grease harden over the time.	Health, Safety & Environment	HSE - Potential injury to field worker trying to operate	Serious	Possible	Moderate	Replace RMU switchgear of the same design	Rare	Low

Appendix B – Zinfra Memorandum regarding operation of HV switchgear

Zinfra ZINFRA MEMORANDUM

Date:	28/10/2022
To:	Zinfra – Jemena Network Services (JNS) – Electricity Distribution: Employees & Contractors
CC:	Jemena Electricity Network (JEN)
From:	Zinfra Operations
Subject	**Operation of High Voltage (HV) Switchgear**

Following the industry representative's concerns raised in relation to HV Switchgear across VESI Networks, a number of consultations and engagements have occurred to gauge specific concerns as they apply specifically to each network.

For Zinfra Operations within the Jemena Electricity Network, this has involved several risk assessment forums and other consultations with key subject matter experts, Health & Safety Representatives and Electrical Trades Union Representatives. This consultation process has identified that it was prudent for Zinfra Operations to implement interim restrictions on the following Switchgear pending the results of the risk assessment outcomes:

1. Outdoor Air Break switches
2. Indoor wall-mounted air break switches
3. HV Isolators on wooden crossarms
4. HV Isolators with brown or blue insulators
5. Pole-mounted gas switches without an interlock or gas indicator
6. RM6 switchgear units with no gas gauges fitted
7. RM6 units that are outside their regular maintenance schedule
8. Oil-immersed HV switchgear within Indoor Substations (Jemena owned/Customer owned)
9. Caution Refer Operations (CRO) Tagged related to HV Switch mechanism

All HV Operators are reminded to perform an SRA and follow approved Safe Work Method Statements (SWMS) prior to beginning any switching activities.

Along with an SRA and prior to commencing works, Operators are to assess equipment before and after completing switching activities as outlined in:

1. **the VESI Switchgear Operating Manual**
2. **Jemena Network Operations Manual ELE-999-OM-EL-002, Switching & Earthing – General 2.1**

When switching electrical apparatus the following shall apply:

- Before operating the equipment:
  - check correct location and apparatus to be operated
  - confirm where practical that a clear ingress & egress access can be maintained
  - check the status and condition of the apparatus
  - check the condition, i.e. open / closed.
- After operating a piece of equipment, the operator shall confirm the equipment's status and condition.

All Field Employees are reminded that where a risk assessment has determined that HV Switchgear is not safe to operate, they are to:

1. Suspend switching activities
2. Apply a CRO tag to the asset
3. Contact the relevant Network Control Centre for further advice
4. Notify their manager

The interim restrictions for the identified switchgear types will remain in place whilst Zinfra Management continues to work with Zinfra Subject Matter Experts, Health & Safety Representatives and Jemena Network Representatives.

The Risk Assessment process will continue to be undertaken in consultation with the above parties, with an assessment and action Plan to be concluded. Zinfra is seeking further information from Jemena Network representatives in relation to the outcomes of the draft risk assessments.

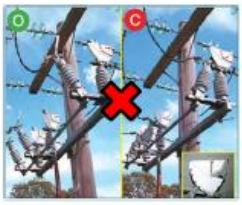
Note: All HV Switchgear located inside Zone Substations (ZSS) is not impacted by any switching restrictions.

Communication of any updates on this matter will be provided through Field Managers, HSRs and Union Representatives. Further updates will be communicated as they become available.

For further information ,please contact [redacted]

The following interim switching restrictions will take immediate effect as of 28th October 19, 2022, the below listed equipment can only to be operated as directed:

1. **HV Air Break Switches (Flicker Blade, Arc Chute, Interrupter):**
   - Not to be operated.


2. **Indoor Wall Mounted Air Break Switch:**
   - Not to be operated.


3. **HV Isolators:**
   - Not to be operated when mounted on a wooden crossarm.
   - Not to be operated if they are brown or blue insulators.
   - New type of HV Isolator mounted on steel crossarms can be operated as normal.

4. **Indoor Oil filled Switches**
   - Not to be operated.

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Memorandum № ZIN MM 2019 002

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5. ABB Manual Gas Switches (Non automatable): Caution

- Before operating any ABB Manual Gas Switches, the pre-operation inspection must include checking the status and condition of the semaphore. Where the status of the semaphore cannot be determined by ground inspection, a closer inspection is to be performed using an EWP.
- Must not be operated when there is not a low gas semaphore displayed.
- Must not be operated when the semaphore is cloudy or cannot be clearly read, the Switchgear is to be CRO tagged.

6. RM6 Switchgear: Caution

- Not to be operated live where the gas level cannot be reasonably determined to be within the safe operating range.
- If a gas gauge is not fitted and the operator cannot reasonably determine the Switchgear has a low-level gas interlock, the unit is only to be operated de-energised.

Appendix C – Red Alert

Red Alert

Primary High Risk Control: **Live Electricity**

Update to Metal clad switch gear without a gas indicator gauge

What happened?

On Wednesday October 5, WorkSafe attended Powercor to further review and discuss issues related to the operation of HV switchgear on the CPPAL networks.
As a result of that meeting, WorkSafe have issued an Improvement Notice (№ WS-58767 now closed out) advising they have determined a hazard exists where employees are at the risk of sustaining an injury by exposure to a failure of the switch gear from low or no gas. The scenario exists where the operator is not able to identify the gas pressure of metal clad switchgear due to it not having a gas gauge or indicator to verify pressure whilst performing switching operations.

The Improvement Notice states:

> *'Employees operating metal clad switch gear are at risk of sustaining an injury by exposure to a failure of the switch gear from low or no gas by not being able to identify the gas level due to not having a gas gauge or indicator fitted.'*

WorkSafe advised that the directions to remedy are:

> *'POWERCOR AUSTRALIA LTD must provide a safe system of work for the operation of metal clad switchgear to ensure it is safe and without risks to health.'*

Impact

Potential to operate HV switch with low or no gas pressure without suitable PPE for the task.

Immediate action to be taken

An AFARP assessment (As Far As Reasonably Practicable) and RCM (Reliability Centred Maintenance) analysis has been undertaken to understand and manage the risk associated with Metal-Clad gas insulted switchgear.

Authorised HV Operators are advised Metal Clad Switchgear containing SF6 gas without gauges, with defective gauges, or without other means of gas level confirmation such as contacts or interlocks may only be operated de-energised or with operators wearing Cat 4 rated PPE.

Portable remote control units are still being investigated, however due to lack of availability from local suppliers this is not considered a control at this time. Replacement strategies are being implemented in line with existing business processes and will be considered on an as needed basis.

HSE

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Red Alert

Field staff are to report identified equipment to the control room to apply CRO "no gas gauge operate de-energised or use CAT 4 PPE while operating" tags.

Existing CRO inoperable tags applied for "no gas gauge" are to be updated as above with "CRO inoperable" removed and to reflect CRO "no gas gauge use CAT 4 PPE while operating" tags.

Known impacted equipment includes:

- Merlin Gerin (MG) Type 2 RMU units
- Merlin Gerin (MG) Vercors M6
- Merlin Gerin (MG) SM6
- ABB/BBC RGCC – *typically these have internal gauges viewed through a viewing window and mirror arrangement that have been proven to be unreliable / defective and should be CRO'd inoperable "internal gas gauge". Some RGCC equipment have had internal gauges replaced with external gauges by the manufacturer. Any ABB/BBC RGCC equipment with external gauge is not covered by this Red Alert and can be operated as normal.*

HSE

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Appendix D: Extract of Significant Incident Alert for ILJIN has switches

Significant Incident Alert

HSE Alert

Mechanical failure of Overhead ILJIN SF_6 Gas Load Break Switch

This alert is to provide notification and advice to personnel and contractors that a significant incident has occurred; the information contained is only preliminary with further information to be provided following the completion of a full investigation.

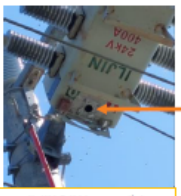
To be communicated	Immediately through all field work groups, contractors, and external parties		
Incident details	Time: 14:20	Date: 19/10/2022	Location: Pole 1305603 - Hackworth Rd, Rye VIC 3941 (adjacent to 163 Canterbury Jetty Rd.)

Brief description of incident – *what happened, task being undertaken and injury/propriety damage if any.*

During the operation of a pole-mounted ILJIN 24kV SF6 gas load break switch on the United Energy Network, a mechanical failure occurred, resulting in a component of the gas switch falling approx. 11.5m and striking the Network Operator on the foot.

The gas switch was being manually operated by a telescopic stick from the ground. Upon closing the switch, the gas gauge and lock out mechanism (weighing approx. 1.2kg) fell from the gas switch and struck the operator on the steel cap of their safety footwear. The Network Operator was not injured and returned to normal duties.

The Network Operator immediately contacted United Energy Network Control Centre (NCC), reported the incident to their supervisor, and requested additional field resources. Emergency switching was undertaken, and the gas switch was made safe. An investigation was commenced, and WorkSafe VIC were notified of the event.



ILJIN 24kV gas switch


Gas gauge and lock mechanism that fell from Gas Switch


Impact on Safety Footwear

Restricted Activities

Zinfra instructs that all employees and its contractors ***DO NOT OPERATE ANY ILJIN SF6 Gas Load Break Switches on the United Energy Network until further notice.***
Treat all ILJIN Gas Switches regardless of voltage in the same manner.
This incident is subject to investigation, and findings will be shared once all contributing factors are identified.

Record Information

Date of Issue: 21/10/2022
HSE Alert Number: Z-SIA-2022-009
Number of Pages: 1 of 1

For more information:

Contact your HSE Business Partner

Zinfra
Your trusted partner in energy

Appendix E – ILJIN Take Action Alert

HSEQ Alerts
JAA HSE TP 0002
Version 2.0

TAKE ACTION

Interim Ban on Operating Overhead ILJIN SF6 Gas Load Break Switches installed on the Jemena Electricity Network.

Current State

It has been identified that the interlocking mechanism component of Iljin switches consisting of a pin, semaphore and cover plate, may be seized and not functioning as required due to the buildup of corrosion, dirt and grim. The function of the interlocking mechanism is as a safety feature to indicate if the device is at a low gas status.

There are approximately 235 units of this type of switch installed on the Jemena Electricity Networks (JEN) .

What is being done.

1. Overhead ILJIN SF6 Gas Load Break Switches are now not to be operated until further notice.
2. Overhead ILJIN SF6 Gas Load Break Switches are not to be used as isolation points until further notice.
3. The JEN Control Room has applied INOP tags to switches of this type, effective immediately.
4. The JEN Assets & Operations Electricity Team is preparing to implement an inspection program to verify the condition of the interlocking mechanism on the existing fleet of Overhead ILJIN SF6 Gas Load Break Switches installed on the JEN.

As more information becomes available on this issue it will be communicated to all stakeholders.

Record Information
Author: Sam Diab.
Date of Issue: 11/08/23
HSE Alert Number: 2023-028

Please communicate this Alert to your teams as a priority.

For more information contact your HSE Business Partner

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