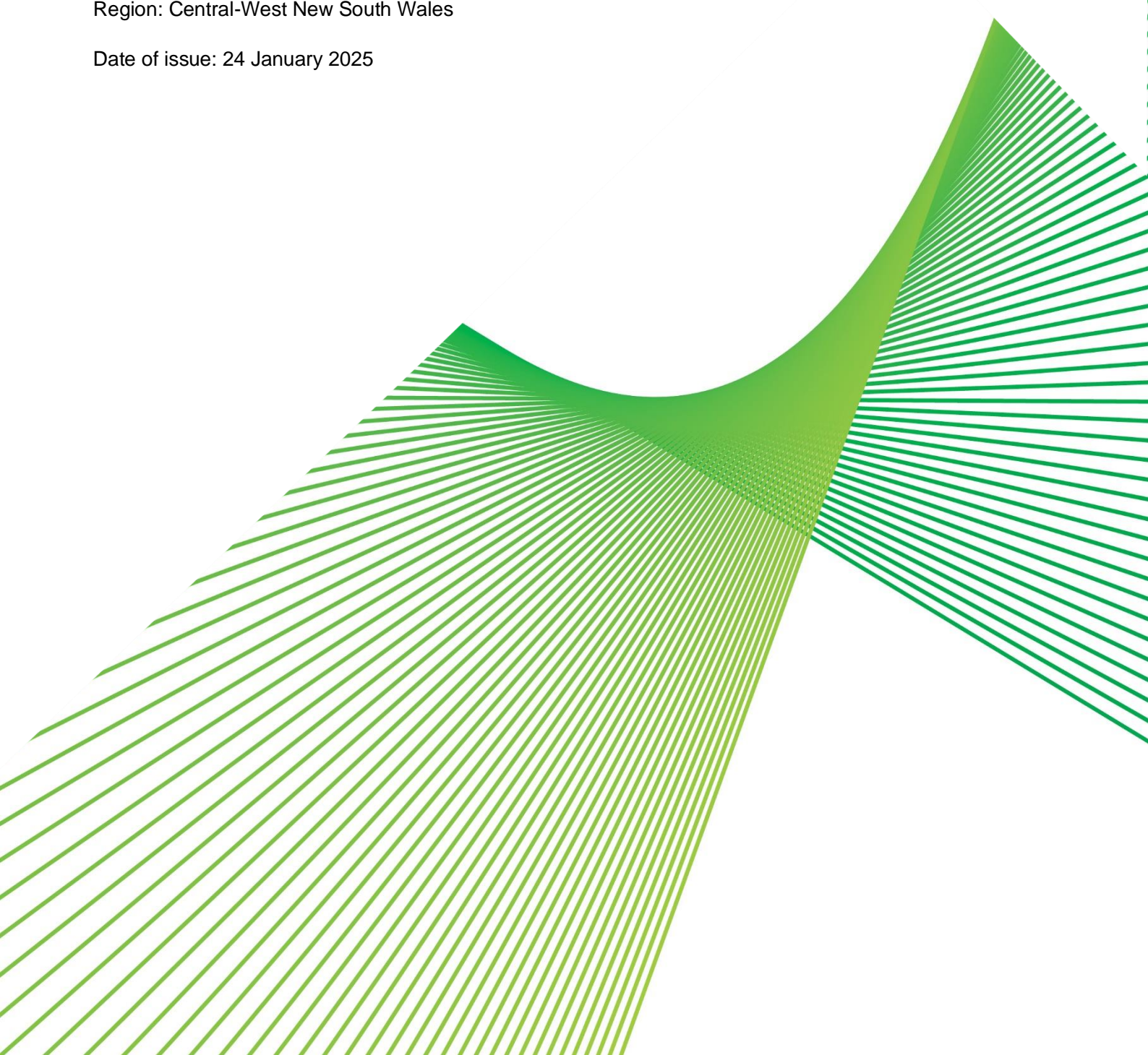


Summary: Maintaining compliance with performance standards applicable to Panorama substation secondary systems

RIT-T Project Specification Consultation Report

Region: Central-West New South Wales

Date of issue: 24 January 2025



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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options focused on maintaining the safe and reliable operation of Panorama substation. This Project Specification Consultation Report (PSCR) represents the first step in the application of the RIT-T.

Panorama 132/66kV substation comprises 2x 132kV feeders, 2x 132/66/11kV transformers and 5x 66kV feeders. The site was established in 1979, and the secondary systems assets have installation dates ranging between 1977 and 2012. Panorama substation is a customer connection point supplying Essential Energy's 66kV network in the area inclusive of Bathurst which contains Bathurst Correctional Centre and Hospitals.

Secondary systems assets at Panorama substation are facing technological obsolescence. This obsolescence increases both the time to rectify defects and the risk that primary assets at the substation may not be able to reliably operate.

Identified need: meet the service level required under the National Electricity Rules for protection schemes

Secondary systems are used to control, monitor, protect and provide communication to facilitate safe and reliable network operation.¹ They are necessary to ensure the secure operation of the transmission network and prevent damage to primary assets when adverse events occur.

The secondary system assets at Panorama are subject to technological obsolescence. This means that the technology is no longer being manufactured or supported. Reactive replacement of failed secondary systems components is not sustainable and impacts our ability to meet the requirements of the National Electricity Rules (NER).

Redundant protection schemes are required to ensure the transmission system is adequately protected as outlined in the Network Performance Requirement under Schedule 5.1 of the NER, therefore the condition issues affecting the identified protection relays on the NSW transmission network must be addressed. The Network Performance Requirements, set out in Schedule 5.1 of the NER, place an obligation on Transmission Network Service Providers (TNSPs) to provide redundant protection schemes to ensure the transmission system is adequately protected. Clause 5.1.9(c) of the NER requires a TNSP to provide sufficient primary and back-up protection systems (including breaker fail protection systems), to ensure that a fault of any type anywhere on its transmission system is automatically disconnected.

Additionally, TNSPs are required to disconnect the unprotected primary systems where a secondary systems fault lasts for more than eight hours (for planned maintenance) or 24 hours (for unplanned outages). TNSPs must also ensure that all protection systems for lines at a voltage above 66 kV are well-maintained so as to be available at all times other than for short periods (less than eight hours), while the maintenance of protection systems is being carried out.² In the event of an unplanned outage, AEMO's Power System Security Guidelines require that the primary network assets must be taken out of service within 24 hours.³

¹ As per Schedule 5.1 of the NER.

² As per S5.1.2.1(d) of the NER.

³ AEMO. "Power System Security Guidelines, 3 June 2024." Melbourne: AEMO, 2024. Accessed 4 June 2024.

Furthermore, as per clause 4.11.1 of the NER, remote monitoring and control systems are required to be maintained in accordance with the standards and protocols determined and advised by AEMO.

A failure of the secondary systems would involve replacement of the failed component or removing the affected primary assets, such as lines and transformers, out of service. Though replacement of failed secondary systems component is a possible interim measure, the approach is not sustainable as the stock of spare components will deplete due to the technology no longer being manufactured or supported. Once all spares are used, replacement will cease to be a viable option to meet performance standards stipulated in clause 4.6.1 of the NER.

If the failure to provide functional secondary systems due to technology obsolescence is not addressed by a technically and commercially feasible credible option in sufficient time (by 2027/28), the likelihood of not recovering from secondary systems faults and not maintaining compliance with NER performance requirements will increase.

The proposed investment will enable us to continue to meet the standards for secondary systems availability set out in the NER, and to avoid the impacts of taking primary assets out of service. Consequently, it is considered a reliability corrective action under the RIT-T. A reliability corrective action differs from a 'market benefits'-driven RIT-T in that the preferred option is permitted to have negative net economic benefits on account of it being required to meet an externally imposed obligation on the network business.

Two credible network options have been identified

We have identified two credible network options that would meet the identified need from a technical, commercial, and project delivery perspective.⁴ These options are summarised in Table E-1 below.

Table E-1 Summary of credible options

Option	Description	Estimated capex (\$m, 2024/25 +/- 25%)	Operating costs (\$ per year, \$2024/25)
Option 1	Replace individual assets	11.36	16,879
Option 2	Complete in-situ renewal	9.80	7,389

Assets with deteriorating condition to be replaced include Protection Schemes, Control Systems and Metering Systems.

Non-network options are not expected to be able to assist with this RIT-T

We do not consider non-network options to be commercially and technically feasible to assist with meeting the identified need for this RIT-T. Non-network options are not able to meet NER obligations to provide redundant secondary systems, metering or control and ensure that the transmission system is adequately protected.

⁴ As per clause 5.15.2(a) of the NER.

Draft Conclusion

This PSCR finds that implementation of Option 2 is the preferred option to address the identified need. Option 2 involves replacement of all secondary systems at the site. This option will adopt an automation philosophy consistent with current design standards and practices. This option also includes replacement of Direct Current (DC) supplies to account for an increase in secondary systems power requirements and remediation of the 415 V Alternating Current (AC) distribution in the building and switchyard.

The condition of various categories of automation assets such as protection relays, control systems, AC distribution, and DC supply systems creates a need for modernisation. This will deliver benefits such as reduced preventative maintenance requirements, improved operational efficiencies, better utilisation of our high-speed communications network, improved visibility of assets using modern technologies and reduced reliance on routine maintenance and testing. There are also additional operational benefits available to improved remote monitoring, control and interrogation, efficiency gains in responding to faults, and phasing out of obsolete and legacy systems and protocols.

The capital cost of this option is approximately \$9.80 million (in \$2024/25). The works will be undertaken between 2024/25 and 2026/27. Planning, design, development and procurement (including the completion of the RIT-T) will occur between 2024/25 and 2025/26, while project delivery and construction will occur in 2026/27. All works are expected to be completed by 2026/27, with final commissioning of the solution expected in 2027/28 to best meet the need of meeting the service level required for protection schemes. Routine operating and maintenance costs are estimated to be approximately \$7,389 per annum (in \$2024/25).

Exemption from preparing a Project Assessment Draft Report

Subject to the identification of additional credible options during the consultation period, publication of a Project Assessment Draft Report (PADR) is not required for this RIT-T as we consider that the conditions in clause 5.16.4(z1) of the NER exempting RIT-T proponents from providing a PADR have been met.

Specifically, production of a PADR is not required because:

- the estimated capital cost of the preferred option is less than \$54 million⁵;
- we have identified in this PSCR our proposed preferred option, together with the reasons for the preferred option; and
- the proposed preferred option and any other credible options in respect of the identified need do not have any material market benefits (except for market benefits arising from changes in involuntary load shedding).

If an additional credible option that could deliver a material market benefit is identified during the consultation period, then we will produce a Project Assessment Draft Report (PADR) that updates the NPV assessment presented in this PSCR.

Submissions and next steps

We welcome written submissions on materials contained in this PSCR. Submissions are due on 3 May 2025.⁶

⁵ Varied from \$43m to \$54m based on the [AER Final Determination: Cost threshold review](#), November 2024.

⁶ Consultation period is for 12 weeks. Additional days have been added to cover public holidays.

Submissions should be emailed to our Regulation team via regulatory.consultation@transgrid.com.au.⁷ In the subject field, please reference 'Panorama Secondary Systems PSCR'.

At the conclusion of the consultation process, all submissions received will be published on our website. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement.

We intend to produce a Project Assessment Conclusions Report (PACR) that addresses all submissions received and presents our draft analysis and conclusion on the preferred option for this RIT-T. Subject to submissions to this PSCR, we anticipate publication of a PACR by the end of June 2025.

⁷ We are bound by the *Privacy Act 1988 (Cth)*. In making submissions in response to this consultation process, we will collect and hold your personal information such as your name, email address, employer and phone number for the purpose of receiving and following up on your submissions. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement. See Privacy Notice within the Disclaimer for more details.