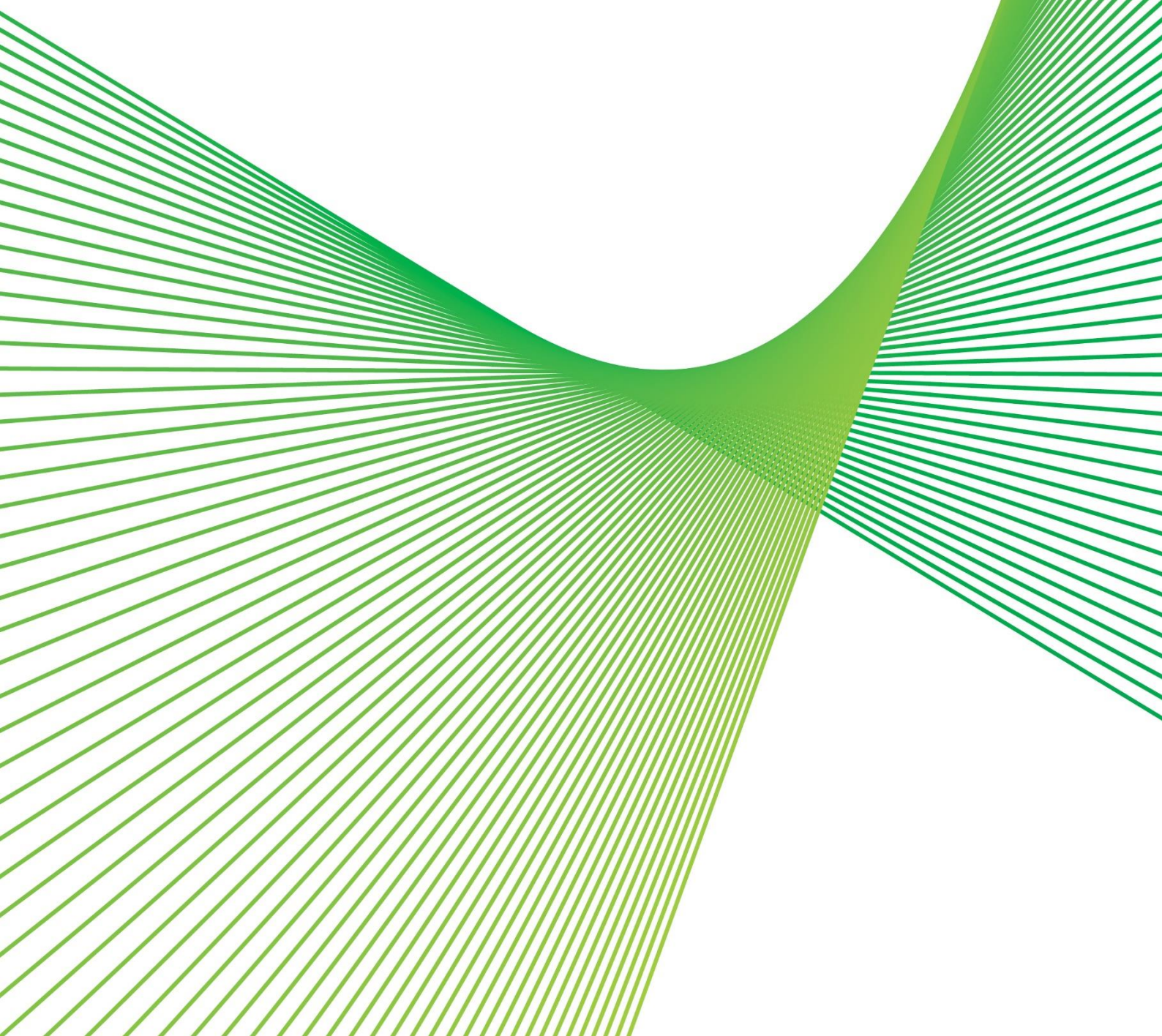


Summary: Maintaining safe and reliable operation of Beryl substation

RIT-T Project Specification Consultation Report

Region: Central West NSW

Date of issue: 18 May 2023



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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for maintaining the safe and reliable operation of Beryl Substation. Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

Beryl substation was commissioned in 1976 and forms part of our network that serves the central west NSW area and is supplied via two 132kV feeders (Line 94B and 94M), and feeds six customer 66kV lines operated by Essential Energy. The substation is expected to continue to play a central role in the safe and reliable operation of the power system throughout and after the transition to a low-carbon electricity future. The central west NSW area is expected to experience strong growth over the next 10 years, with maximum demand forecast to grow by approximately 17% by 2031/32.¹

The condition of certain 132 kV and 66 kV high voltage and secondary system assets at Beryl substation has deteriorated over time leading to an increasing risk of failure which could result in reliability, safety, environment and financial consequences. The secondary systems assets are also impacted by obsolescence of the equipment, increasing the time to reactively rectify faults and increasing the risk that primary assets at the substation may not be able to reliably operate.

The purpose of this PSCR is to examine and consult on options to address the deterioration of the high voltage and secondary systems asset condition and the risk from technology obsolescence of the secondary systems at Beryl substation.

Identified need: ensure the safe and reliable operation of Beryl substation

The identified need for this project is to maintain the safe and reliable operation of Beryl substation and the broader transmission network in NSW by addressing the risk of failure of certain high voltage and secondary systems at the substation.

Condition assessments performed through our routine maintenance program has shown degradation in the condition of these high voltage and secondary systems assets which will increase their risk of failure. Without intervention, other than ongoing business-as-usual maintenance, the assets are expected to deteriorate further and more rapidly. This will increase the risk of supply interruptions to our customers as well as safety, environmental and financial consequences.

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

We have classified this RIT-T as a 'market benefits' driven RIT-T as the economic assessment is not being progressed specifically to meet a mandated reliability standard but by the net benefits that are expected to be generated for end-customers. However, the options considered in this PSCR will also ensure compliance with a range of obligations under the NER and jurisdictional instruments (which is not expected to be the case under the base case), including obligations set out in Schedule 5.1 of the NER to provide redundant secondary systems and ensure that the transmission system is adequately protected.

¹ Transgrid, NSW Transmission Annual Planning Report 2022, p.128.

One credible network option has been identified

We have identified one credible network option that meets the identified need from a technical, commercial, and project delivery perspective.² This option is summarised in the below. Table **Error! No text of specified style in document.-2** below presents a list of the specific assets with deteriorating condition to be replaced under Option 1.

Table **Error! No text of specified style in document.-1**: Summary of the credible options

Option	Description	Capital costs (\$M, 2021-22)	Operating costs (\$M/yr, 2021-22)
Option 1	Targeted replacement of high voltage and secondary system assets	7.06	0.02

Table **Error! No text of specified style in document.-2**: List of assets to be replaced under Option 1

Item	Asset
Protection relays	Line 94B 132kV – No2 Protection 66kV Capacitor No.2 - No1 Protection 66kV Capacitor No.2 - No2 Protection 66kV Capacitor No.3 - No1 Protection 66kV Capacitor No.3 - No2 Protection 66kV Capacitor No.4 - No1 Protection 66kV Capacitor No.4 - No2 Protection Line 86J 66kV – No1 Protection Line 86J 66kV – No1 Protection Line 80R 66kV – No1 Protection Line 80R 66kV – No1 Protection Line 381 66kV – No1 Protection Line 381 66kV – No1 Protection Line 851 66kV – No1 Protection Line 851 66kV – No1 Protection Line 80U 66kV – No1 Protection Line 80U 66kV – No1 Protection Line 852 66kV – No1 Protection Line 852 66kV – No1 Protection
Control systems	110V DC Supply – No1. Battery 110V DC Supply – No1. Charger 110V DC Supply – No2. Battery 110V DC Supply – No2. Charger
Metering systems	Transformer No.2 - Revenue metering Transformer No.2 - Check metering Transformer No.3 - Revenue metering Transformer No.3 - Check metering
Capacitor banks	66kV 10MVAr No.2 Capacitor Bank
Disconnectors	132kV busbar section 2 132kV busbar section 3
Current transformers	66kV No.3 Transformer

² As per clause 5.15.2(a) of the NER.

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 will not mitigate the safety and environmental risk and are not able to meet NER obligations to provide redundant secondary systems and ensure that the transmission system is adequately protected.

Option 1 delivers the highest net economic benefit and will meet NER requirements

We have assessed that Option 1 is net beneficial under all three reasonable scenarios considered in this PSCR. On a weighted basis, where each scenario is weighted equally, Option 1 is expected to deliver net benefits of approximately \$76.39m. Option 1 will also enable us to meet a range of obligations under the NER and jurisdictional instruments (which is not expected to be the case under the base case), including obligations set out in Schedule 5.1 of the NER to provide redundant secondary systems and ensure that the transmission system is adequately protected.

Draft Conclusion

This PSCR finds that Option 1 is the preferred option to address the identified need. Option 1 involves targeted replacement of high voltage and secondary system assets at Beryl substation that have deteriorating condition and have reached (or will soon reach) the end of their technical lives and for which only limited manufacturer support and spares are available.

The capital cost of this option is approximately \$7.06 million (in \$2021-22). The work will be undertaken over a five-year period with all works expected to be completed by 2027/28. Routine operating and maintenance costs are estimated at approximately \$0.02 million per annum (in \$2021-22).

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 \$46 million;³
- we have identified in this PSCR our preferred option and the reasons for that option, and noted that we will be exempt from publishing the PADR for our preferred option; and
- we consider that the preferred option and any other credible options do not have a material market benefit (other than benefits associated with changes in voluntary load curtailment and 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 PADR that includes an assessment of the net economic benefit of each additional credible option.

If no additional credible options with material market benefits are identified during the consultation period, then the next step in this RIT-T will be the publication of a Project Assessment Conclusions Report (PACR)

³ Varied from \$43m to \$46m based on the [AER Final Determination: Cost threshold review](#), November 2021.

that addresses all submissions received, including any issues in relation to the proposed preferred option raised during the consultation period.⁴

Submissions and next steps

We welcome written submissions on materials contained in this PSCR.

Submissions are due on 15 August 2023⁵ and should be emailed to our Regulation team via regulatory.consultation@Transgrid.com.au.⁶ In the subject field, please reference 'Beryl substation renewal 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.

Should we consider that no additional credible options were identified during the consultation period, we intend to produce a PACR that addresses all submissions received including any issues in relation to the proposed preferred option raised during the consultation period. Subject to additional credible options being identified, we anticipate publication of a PACR by September 2023.

⁴ In accordance with NER clause 5.16.4(z2).

⁵ Consultation period is for 12 weeks, additional days have been added to cover public holidays

⁶ Transgrid is bound by the Privacy Act 1988 (Cth). In making submissions in response to this consultation process, Transgrid 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.