

Powerlink Queensland



Summary
Project Specification Consultation Report
22 September 2023
Addressing the reliability of supply
to Nebo local area

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Summary

Ageing and obsolete primary plant at Nebo Substation requires Powerlink to take action

Nebo Substation was established in the late 1970s to be a major injection point and major 275kV switchyard in the state-wide transmission network, connecting North and South Queensland whilst providing bulk supplies to several key areas, including Mackay and Pioneer Valley. Two 132/11kV transformers and associated primary plant connect the Powerlink substation to the Ergon Energy (part of the Energy Queensland Group) network at Nebo supplying the local area.

The 132/11kV power transformers (Transformer 3 and Transformer 4) and associated 11kV primary plant are nearing the end of their technical lives, with an increasing risk of failure. The failure of a transformer or associated primary plant can result in an extensive replacement timeframe increasing the risk of loss of supply to the local area, and in extreme cases, could present a risk to the safety of personnel.

Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Nebo Substation. Powerlink must therefore take action to avoid the increasing likelihood of unserved energy arising from failure of the ageing transformers and primary plant at Nebo, and ensure customers are provided with a reliable and safe supply of electricity.

Powerlink is required to apply the RIT-T to this investment

As the identified need of the proposed investment is to meet reliability and service standards specified in the Rules, Powerlink's Transmission Authority and applicable jurisdictional instruments, it is classified as a "reliability corrective action"¹.

While analysis of the options to meet the identified need initially fell below the RIT-T cost threshold as discussed in Powerlink's Transmission Annual Planning Reports 2018 - 2021, the most recent detailed design, procurement investigations and cost estimate have identified this is no longer the case. Hence, a RIT-T has been commenced to ensure the prudence and efficiency of the proposed solution.

The identified need is not discussed in the most recent Integrated System Plan (ISP), and is therefore subject to the application and consultation process for RIT-T projects not defined as *actionable ISP projects*².

Powerlink has adopted the expedited process for this RIT-T³, as the preferred option is below \$46 million and is unlikely to result in any material market benefits other than those arising from a reduction in involuntary load shedding. The reduction in involuntary load shedding under the credible⁴ network option presented is catered for in the risk cost modelling and consequentially represented in the economic analysis.

This Project Specification Consultation Report (PSCR) discusses and ranks the potential credible network options, which incorporate cost effective measures over the long-term, to achieve the required service levels.

A non-credible Base Case has been developed against which to compare credible options

Consistent with the Australian Energy Regulator's (AER's) RIT-T Application Guidelines⁵ the assessment undertaken in this PSCR compares and ranks the net present value (NPV) of the credible network option designed to address the emerging risks, relative to a Base Case.

The Base Case is modelled as a non-credible option where the existing condition issues associated with an asset are managed via operational maintenance only, resulting in an increase in risk levels as the condition of the asset deteriorates over time. These increasing risk levels are assigned a monetary value and added to the ongoing maintenance costs to form the Base Case. The Base Case is then used as a benchmark against which to compare and rank

¹ The Rules clause 5.10.2, Definitions, reliability corrective action.

² Refer to Clause 5.16.1 of the Rules.

³ In accordance with clause 5.16.4(z1) of the Rules.

⁴ Clause 5.15.2(a) of the Rules.

⁵ AER, *Application guidelines, Regulatory investment test for transmission*, August 2020.

the credible options designed to offset/mitigate the risks, and to ensure ongoing compliance with regulatory and jurisdictional obligations.

Network options considered to address the identified need

Powerlink has developed one credible network option to address the identified need for maintaining power transfer capabilities and reliability of supply at Nebo Substation. This option proposes a like for like replacement of both transformers and associated 11kV primary plant by 2025. The credible network option, along with its NPV relative to the Base Case is summarised in Table 1 and shows that Option 1 has a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for ‘reliability corrective actions’. The absolute NPVs of the Base Case and Option 1 are shown graphically in Figure 1.

Table 1: Summary of credible RIT-T network options (\$m)

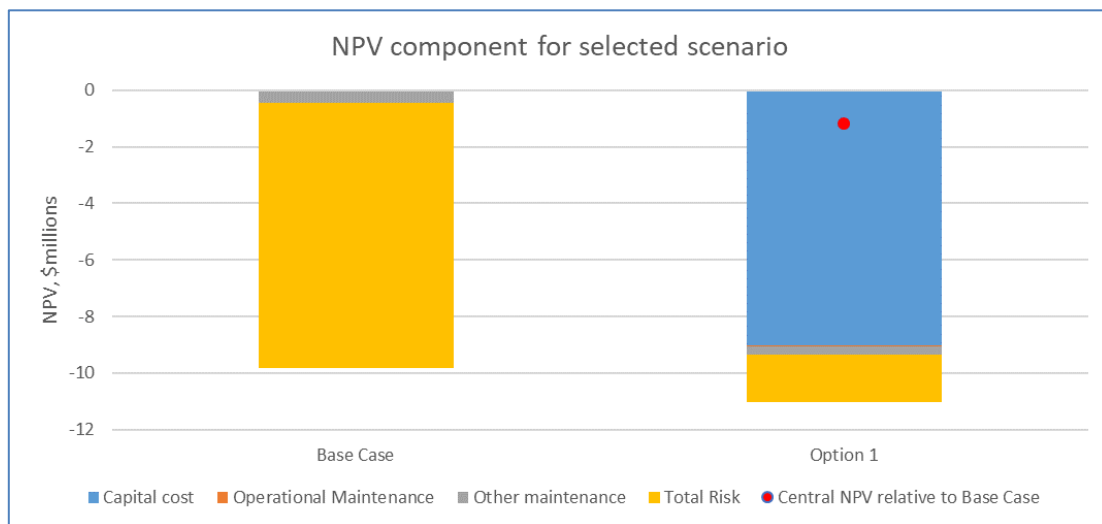
Option	Description	Total Cost (\$m)	Central NPV relative to Base Case (\$m)	Ranking
1	Replace Transformers 3 and 4 and associated 11kV primary plant by 2025	11.50*	-1.17	1

*RIT-T Project

Option 1 is the only credible network option, which addresses the major risks resulting from the deteriorated condition of the ageing transformers and primary plant at Nebo Substation.

Figure 1 shows the breakdown of the NPV of the Base Case and Option 1 for the central scenario. Option 1 reduces the total risk costs arising from the ageing transformers and primary plant at Nebo remaining in service and being managed via operational maintenance only (as in the Base Case).

Figure 1: NPV component of Base Case and Options for central scenario (\$m, real 2023)



Option 1 has been identified as the preferred network option.

The Base Case is not a credible option, in that it does not allow Powerlink to continue to maintain compliance with relevant standards, applicable regulatory instruments and the Rules.

Option 1 is the only credible network option identified and involves the replacement of both 132/11kV transformers and associated 11kV primary plant by 2025. The indicative capital cost of the RIT-T project for the preferred option is \$11.5 million in 2022/23 prices.

It is planned to complete the replacement of both transformers and the associated primary plant by 2025.

Powerlink welcomes the potential for non-network options to form part or all of the solution

Powerlink welcomes submissions from proponents who consider that they could offer a credible non-network option that is both economically and technically feasible by November 2025, on an ongoing basis.

A non-network option that avoids the proposed replacement of the ageing transformers and primary plant would need to replicate, in part or full, the support that Nebo Substation delivers to customers in the area on a cost effective basis.

Lodging a submission with Powerlink

Powerlink is seeking written submissions on this *Project Specification Consultation Report* by Friday, 22 December 2023, particularly on the credible option presented⁶.

Please address submissions to:

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⁶ [Powerlink's website](#) has detailed information on the types of engagement activities, which may be undertaken during the consultation process. These activities focus on enhancing the value and outcomes of the RIT-T engagement process for customers and non-network providers.



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