

Powerlink Queensland



Summary Project Specification Consultation Report

4 October 2022

Addressing the secondary systems condition risks at Tangkam

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Summary

Ageing and obsolete secondary systems at Tangkam Substation require Powerlink to take action

Tangkam Substation was established in 1999 as part of the Oakey Gas Turbine Power Station connection, and is approximately 30km north west of Toowoomba. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Tangkam Substation.

The secondary systems at Tangkam broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring. The majority of Tangkam's secondary systems will reach the end of their technical service lives by June 2023, with only limited manufacturer support and spares available after this time. Over 80% of the 110kV secondary systems equipment is expected to reach an unsupportable level by June 2024.

Increasing failure rates, along with the increased time to rectify faults due to the obsolescence of the equipment, significantly affects the availability and reliability of these systems and their ability to continue to meet the requirements of the National Electricity Rules (the Rules).

Powerlink must therefore take action to ensure ongoing compliance with the Rules.

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

The estimated capital cost of the most expensive credible option to address the identified need meets the minimum threshold to apply the RIT-T.

As the identified need for the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority, guidelines and standards published by the Australian Energy Market Operator (AEMO), and Powerlink's ongoing compliance with Schedule 5.1 of the Rules, it is classified as a 'reliability corrective action'¹.

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 non-ISP projects 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 credible network options is included in the risk cost modelling and consequentially represented in the economic analysis of the options.

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 Guidelines for non-ISP projects⁴, the assessment undertaken in this Project Specification Consultation Report (PSCR) compares and ranks the net present value (NPV) of credible network options 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 due to deterioration of asset condition and rectification of failures taking longer due to obsolescence issues. These increasing risk levels are assigned a monetary value and added to the ongoing maintenance costs to form the Base Case.

Three credible network options have been developed to address the identified need

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

² Refer to Clause 5.16.2 of the NER.

³ In accordance with clause 5.16.4(z1) of the Rules and S4.1 AER Regulatory investment test for transition application guidelines, August 2020

⁴ AER, *Application guidelines, Regulatory Investment Test for Transmission*, August 2020

Powerlink has developed three credible network options to maintain the existing electricity services, ensuring a reliable, safe and cost effective supply to customers in the area.

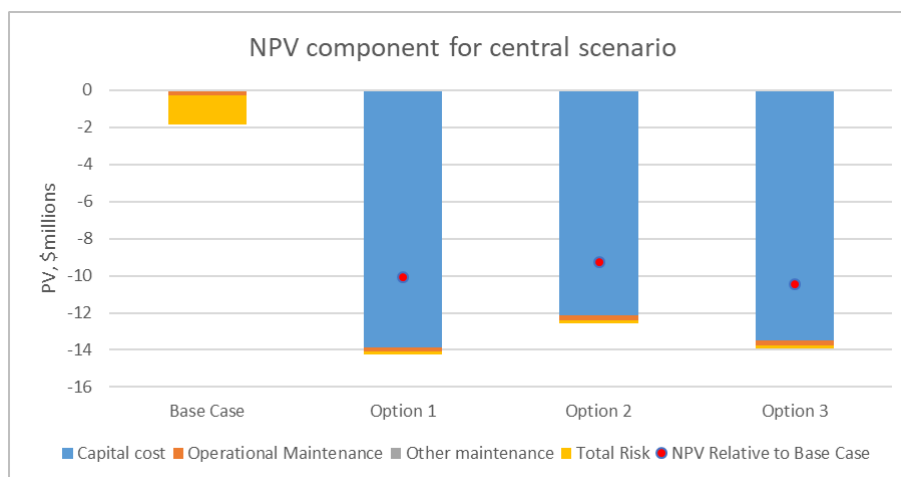
Table 1 details the credible network options and shows that all options have a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for ‘reliability corrective actions’. Of the credible network options, Option 2 has the highest NPV relative to Base Case.

Table 1: Summary of credible network options

Option	Description	Total costs (\$m, 2023)	NPV relative to Base Case (\$m, 2023)	Ranking
1	Staged replacement of selected 110kV secondary systems into a new demountable building by June 2024. Replacement of the remaining bays by June 2028	19.7	-10.1	2
2	Single stage replacement of all 110kV secondary systems into a new demountable building by June 2024	14.6	-9.3	1
3	Single stage replacement of all 110kV secondary systems into the existing building by June 2024	16.2	-10.5	3

Figure 1 shows that the Base Case and all credible options have negative NPVs, with Option 2 having a lower economic cost compared to the other options. All credible options reduce the risk cost arising from the condition of the ageing and obsolete secondary systems at Tangkam Substation compared to the Base Case.

Figure 1: NPV of Base Case and Credible Network Options



Option 2 has been identified as the preferred 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. As the investment is classified as a ‘reliability corrective action’ under the Rules, the purpose of the RIT-T is to identify the credible option that minimises the total cost to customers.

The economic analysis demonstrates that Option 2 provides the lowest cost in net present terms of the three credible options and is therefore the preferred option.

Option 2 involves the single stage replacement of all 110kV secondary systems at Tangkam Substation into a new demountable building by June 2024. The indicative capital cost of this option is \$14.6 million in 2022/23 prices.

Under Option 2, initial design work will commence in early 2023, with installation and commissioning of the new secondary systems completed by June 2024.

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

Due to the nature of secondary systems, Powerlink is of the view that it is unlikely for there to be an economically and technically feasible non-network option to meet the identified need. However, Powerlink welcomes submissions from proponents who consider they could offer a potential non-network option that is both economically and technically feasible by June 2024, on an ongoing basis.

A non-network option that avoids the proposed replacement of the ageing and obsolete secondary systems would need to replicate, in part or full, the support that Tangkam 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, on or before Friday, 6 January 2023, particularly on the credible options presented⁵.

Please address submissions to:

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⁵ [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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