Powerlink Queensland

Summary
Project Specification Consultation Report

6 April 2022

Maintaining power transfer capability and reliability of supply at Redbank Plains

Summary

The condition of transformers and primary plant at Redbank Plains Substation requires Powerlink to take action

Redbank Plains Substation, located approximately 27km southwest of the Brisbane CBD, was established in 1985 as a bulk-supply injection point to the Energex (part of the Energy Queensland group) distribution network. It also provides additional switching capability for alternative power transfer between Blackstone and Goodna.

A recent condition assessment indicates that both power transformers, along with a number of primary plant items are nearing the end of their respective service lives and are displaying a number of condition-based issues.

Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Redbank Plains 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 Redbank Plains, 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].

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-T[3], 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 catered for in the risk cost modelling and consequentially represented in the economic analysis of the options.

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 Guidelines[4] the assessment undertaken in this 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 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 the credible options designed to offset/mitigate the risks, and to ensure ongoing compliance with regulatory and jurisdictional obligations.

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

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

The four credible network options, along with their net present values (NPVs) relative to the Base Case are summarised in Table 1. The absolute NPVs of the Base Case and the Options are shown graphically in Figure 1.

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[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

[4] AER, *Application guidelines, Regulatory investment test for transmission,* August 2020

Table 1: Summary of credible RIT-T network options ($m, real 20/21)

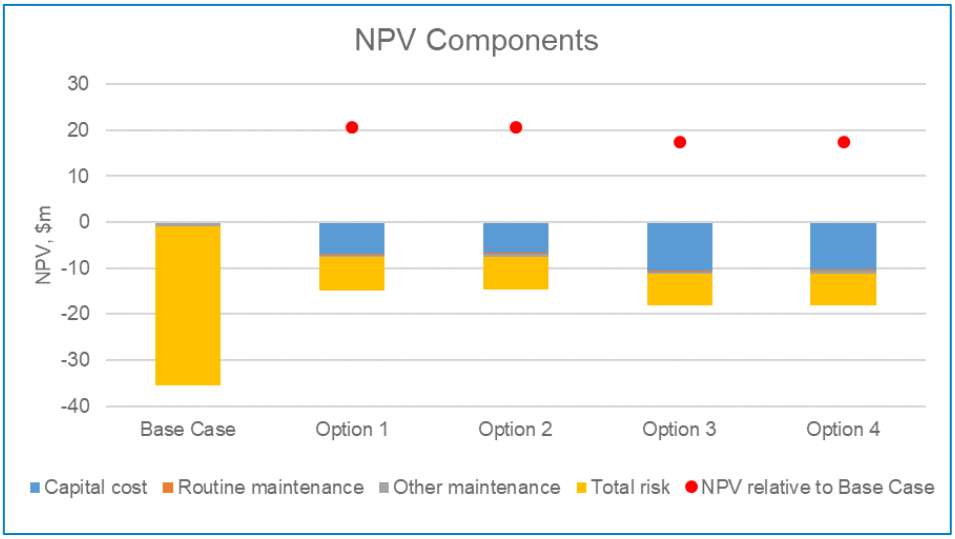
Option	Description	Total Cost	NPV relative to Base Case	Ranking
1	Refit and life extend transformers by 2024, and replace selected feeder and bus bay primary plant by 2025	7.22*	20.63	2
	Replace isolators and earth switches by 2029	2.06†		
	Replace transformers by 2039	8.69†		
2	Refit and life extend transformers by 2024, and replace all feeder bay and bus bay primary plant by 2025	8.45*	20.74	1
	Replace transformers by 2039	8.69†		
3	Replace transformers by 2024 and replace selected feeder and bus bay primary plant by 2025	13.97*	17.40	4
	Replace isolators and earth switches by 2029	2.06†		
4	Replace transformers by 2024, and replace all feeder bay and bus bay primary plant by 2025	15.20*	17.51	3

*RIT-T Project
†Future modelled projects (operational and capital)

All credible options address the major risks resulting from the deteriorated condition of ageing transformers and primary plant at Redbank Plains Substation.

Figure 1 shows the breakdown of the central scenario NPV of the Base Case and the four credible options. All options reduce the total risk costs arising from the ageing assets at Redbank Plains remaining in service and being managed via operational maintenance only (as in the Base Case), and hence reflect a net economic benefit when compared to the Base Case.

Figure 1: Central scenario NPV component of Base Case and Options ($m, real 20/21)



Option 2 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. The economic analysis demonstrates that Option 2 provides the highest net economic return relative to the Base Case of the four credible options and is therefore the preferred option.

Option 2 involves the refit of the two 110/11kV 25MVA transformers to extend their service life and the replacement of all feeder bay and bus bay primary plant by 2025. The indicative capital cost of the RIT-T project for the preferred option is $8.45 million in 2020/21 prices excluding future model project costs.

Under Option 2, procurement of new plant would commence in 2022, with refurbishment of the existing transformers and replacement of selected primary plant completed 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 June 2024, on an ongoing basis.

A non-network option that avoids the proposed replacement of ageing primary plant and refit of transformers would need to replicate, in part or full, the support that Redbank Plains 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 Monday, 11 July 2022, particularly on the credible options presented[5].

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.

Contact us

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