Powerlink Queensland

Summary of Project Assessment Conclusions Report

18 April 2023

Maintaining power transfer capability and reliability of supply at Redbank Plains

Executive Summary

Redbank Plains Substation is located approximately 27km southwest of the Brisbane CBD. The site 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. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Redbank Plains Substation.

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 range of condition-based issues.

Powerlink must therefore take action to avoid the increasing likelihood of unserved energy and the emerging risks arising from the condition of the primary plant at Redbank Plains Substation. As the identified need of the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority and guidelines and standards published by the Australian Energy Market Operator (AEMO), and to ensure Powerlink's ongoing compliance with Schedule 5.1 of the Rules, it is classified as a 'reliability corrective action'[1].

This Project Assessment Conclusions Report (PACR) represents the final step in the Regulatory Investment Test for Transmission (RIT-T) process prescribed under the National Electricity Rules (Rules) undertaken by Powerlink to address the condition risk of the transformers and primary plant at Redbank Plains Substation. It contains the results of the planning investigation and the cost-benefit analysis of credible options compared to a non-credible Base Case where the emerging risks are left to increase over time. In accordance with the RIT-T, the credible option that maximises the present value of net economic benefits is recommended as the preferred option.

Credible options considered

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 major difference between the credible options relates to whether to replace the transformers or to undertake a life extension and defer replacement, in combination with either staged replacement, or complete replacement of the primary plant.

By addressing the condition risks, all options allow Powerlink to meet the identified need and continue to meet the reliability and service standards specified within Powerlink's Transmission Authority, Schedule 5.1 of the Rules, AEMO guidelines and standards and applicable regulatory instruments.

Powerlink published a Project Specification Consultation Report (PSCR) in April 2022 to address the condition risks of the transformers and primary plant at Redbank Plains Substation. No submissions were received in response to the PSCR that closed on 11 July 2022. As result, no additional credible options have been identified as a part of this RIT-T consultation.

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. Of the four credible network options, Option 2 has the highest NPV relative to the base case.

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

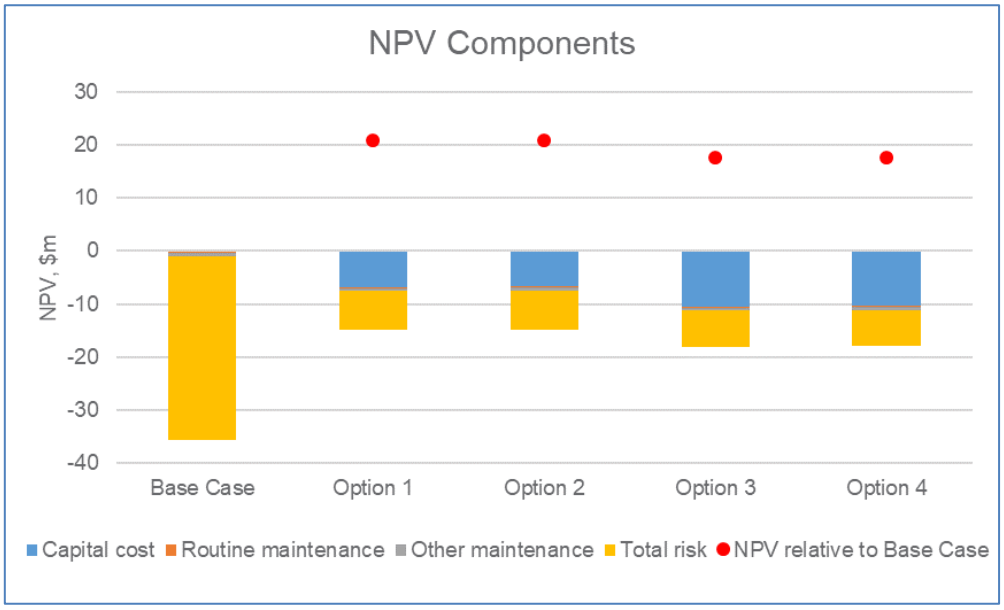
Table 1: Summary of credible network options ($m, real 20/21)

Option	Description	Total Cost ($m)	NPV relative to Base Case ($m)	Ranking
1	Refit and life extend transformers by 2024, and replace selected feeder and bus bay primary plant by 2025	7.22*	20.80	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*	20.91	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*	17.59	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*	17.70	3

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

The absolute NPVs of the Base Case and the credible options are negative, shown graphically in Figure 1, with Option 2 being the least negative of the credible options. All options significantly reduce the total risks arising from the condition of the ageing assets at Redbank Plains remaining in service, enabling Powerlink to continue to meet reliability and service standards specified within its Transmission Authority. They also ensure Powerlink's ongoing compliance with Schedule 5.1 of the Rules and guidelines and standards published by the Australian Energy Market Operator (AEMO).

Figure 1: Central scenario NPV components of Base Case and credible network options ($m, real 20/21)



Evaluation and Conclusion

The RIT-T requires that the preferred option maximises the present value of net economic benefit, or minimises the net cost, to all those who produce, consume and transport electricity. The cost-benefit analysis demonstrates that Option 2 provides the greatest net economic benefit in NPV terms and is therefore the preferred option.

In accordance with the expedited process for the RIT-T, the PSCR made a draft recommendation to implement Option 2, which involves the refit of the transformers by 2024 to extend their service life and complete replacement of the primary plant by 2025. The indicative capital cost of this option is $8.45 million in 2020/21 prices excluding future model project costs. Under Option 2, procurement of new plant would commence in 2023, with refurbishment of the existing transformers and replacement of selected primary plant completed by 2025. Powerlink is the proponent of this network project.

As the outcomes of the cost-benefit analysis contained in this PACR remain unchanged from those published in the PSCR, the draft recommendation has been adopted as the final recommendation, and will now be implemented.

Dispute Resolution

In accordance with the provisions of clause 5.16B(a) of the Rules, Registered Participants, the AEMC, Connection Applicants, Intending Participants, AEMO and interested parties may, by notice to the AER, dispute conclusions in this report in relation to:

- the application of the RIT-T,
- the basis upon which the preferred option was classified as a reliability corrective action or
- the assessment of whether the preferred option has a *material inter-regional impact* or not

Notice of a dispute must be given to the AER within 30 days of the publication date of this report. Any parties raising a dispute are also required to simultaneously provide a copy of the dispute notice to Powerlink, as the RIT-T proponent.

Contact us

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