Powerlink Queensland

Summary
Project Assessment Conclusions Report
25 October 2019

Maintaining power transfer capability and reliability of supply at Lilyvale

Summary

Lilyvale Substation, located approximately 50km from Emerald, plays a critical role in the supply of electricity to customers in Queensland's Central West region, as well as the Blackwater and Bowen Basin mining areas. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Lilyvale Substation supporting a diverse range of customer needs in the area.

Commissioned over 38 years ago, much of the substation's primary plant, including two of the original three 132/66 kV transformers, are reaching the end of their technical service lives and are no longer supported by the manufacturer, with limited spares available to rectify a failure if one were to occur.

The increasing likelihood of faults arising from the condition of Lilyvale's ageing and obsolete transformers and primary plant remaining in service beyond October 2022, exposes customers to the risks and consequences of an increasingly unreliable electricity supply.

There is a requirement for Powerlink to address these emerging risks. As the identified need for the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority and to ensure Powerlink's ongoing compliance with Schedule 5.1 of the National Electricity Rules (the Rules) and relevant jurisdictional obligations[1], it is classified as a 'reliability corrective action'[2].

This Project Assessment Conclusions Report (PACR) represents the final step in the RIT-T process prescribed under the Rules undertaken by Powerlink to address the condition risks arising from the ageing transformers and primary plant at Lilyvale 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 net present value (NPV) of economic benefit, or minimises the costs, is recommended as the preferred option.

Credible options considered

Powerlink has developed two credible network options to maintain the existing electricity services, ensuring an ongoing reliable, safe and cost effective supply to customers in the area. The options result in different substation configurations by 2027, with the existing three 132/66kV 80MVA transformers being replaced by three 100MVA transformers in Option 1 and by two 160 MVA transformers in Option 2.

By addressing the condition risks, both options presented 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 and relevant jurisdictional obligations.

Powerlink published a Project Specification Consultation Report (PSCR) in May 2019 to address the risks arising from the condition of the ageing transformers and primary plant at Lilyvale Substation.

Interest was shown by three non-network proponents in response to the PSCR, and subsequent discussions were held with two, however the proponents ultimately decided not to progress with formal submissions. As a result, no additional credible options to meet the identified need were identified as part of this RIT-T consultation.

The two credible network options, along with their net present values (NPVs) relative to the Base Case are summarised in Table 1. Option 2 is ranked first of the two credible options, with the highest NPV relative to the Base Case.

[1] Electricity Act 1994, Electrical Safety Act 2002 and Electricity Safety Regulation 2013

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

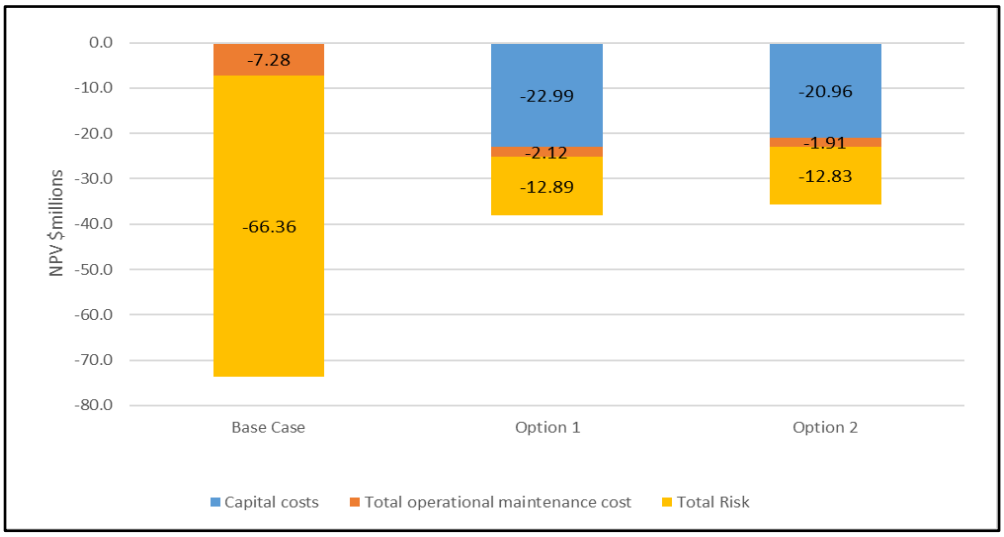
Table 1: Summary of credible RIT-T network options

Option	Description	Total Cost ($m) 2018/19	NPV relative to Base Case ($m) 2018/19	Ranking
Option 1	Replacement of two 132/66kV 80MVA transformers with two 100MVA transformers and full-bay replacement of primary plant in selected bays by October 2022.	25.39*	35.65	**2**
	Replacement of remaining 80MVA transformer with 100MVA transformer by December 2027	8.13†		
	TOTAL	**33.52**		
Option 2	Replacement of two 132/66kV 80MVA transformers with two 160MVA transformers and full-bay replacement of primary plant in selected bays by October 2022.	26.27*	37.95	**1**
	Decommissioning of remaining 80MVA transformer by December 2027	1.96†		
	TOTAL	**28.23**		

*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. All options reduce the total risk and maintenance costs arising from the ageing and obsolete assets at Lilyvale remaining in service, with Option 2 having the largest reduction and reflecting a net economic benefit of $37.95 million compared to the Base Case.

Figure 1: NPV of Base Case and Options ($m, 2018/19)



Evaluation and Conclusion

The RIT-T requires that the proposed preferred option maximises the present value of net economic benefit, or minimises the net cost, to all those who produce, consume and transport electricity in the market.

In accordance with the expedited process for this RIT-T, the PSCR made a draft recommendation to implement Option 2, which delivers a net economic benefit of $37.95m compared to the Base Case.

The RIT-T project for Option 2 involves the replacement of two 132/66kV 80MVA transformers with two 160MVA transformers and the full bay replacement of primary plant in selected bays by October 2022. The substation's third 80MVA transformer will be decommissioned under a separate operational project by December 2027. The indicative capital cost of the RIT-T project for the preferred option is $26.27 million in 2018/19 prices.

Under Option 2, design work would commence in 2020 with the installation of the new transformers and primary plant completed by October 2022.

As the outcomes of the economic analysis contained in this PACR remain unchanged from those published in the PSCR, the draft recommendation has been adopted without change as the final recommendation, and will now be implemented.

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