Powerlink Queensland

Summary
Project Specification Consultation Report
30 May 2019
Maintaining reliability of supply in the Blackwater area

Summary

Ageing transformers at Blackwater Substation require Powerlink to take action

Blackwater Substation, established in 1969 and located approximately 68km east of Emerald, plays a critical role in the provision of electricity to customers in Queensland's Central West area, providing supply to residential, mining and rail traction loads. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Blackwater Substation supporting the diverse range of customer needs in the area.

The substation's 132kV switchyard includes three 132/66/11kV transformers (2 x 80MVA and 1 x 160MVA) which provide connections to the Ergon Energy (part of the Energy Queensland Group) distribution network. The two 80MVA transformers were installed in 1978, and at over 40 years of age have significant condition and performance issues indicating that they are reaching the end of their technical service lives. The third transformer, rated at 160MVA, was installed in 2006 and is in good working condition.

The increasing likelihood of faults arising from the condition of the ageing 80MVA transformers at Blackwater remaining in service beyond June 2022, exposes customers to the risks and consequences of an increasingly unreliable electricity supply.

There is a need for Powerlink to address this emerging risk under the reliability and service standards set out in its mandated jurisdictional and Rules' obligations.

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

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

As the proposed investment is to meet reliability and service standards specified within applicable regulatory instruments, and to ensure Powerlink's ongoing compliance with Schedule 5.1 of the Rules, it is classified as a 'reliability corrective action'[1].

The most expensive credible network option identified in this PSCR meets the capital expenditure cost threshold of $6 million, initiating public consultation under the Rules. Powerlink has adopted the expedited process for this RIT-T[2], as the preferred option is below $43 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.

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

Consistent with the RIT-T Application Guidelines[3] 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.

Three credible network options to address the identified need

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

The three credible network options, along with their net present values (NPVs) relative to the Base Case are summarised in Table 1 below. The absolute NPV's of the Base Case and the

[1] The Rules clause 5.10.2, Definitions, reliability corrective action.
[2] In accordance with clause 5.16.4(z1) of the Rules
[3] AER, Application guidelines, Regulatory investment test for transmission, December 2018

Options is shown graphically in Figure 1. All three credible options will address the identified need on an enduring basis. Table 1 shows that Option 2 is ranked first of the three credible options, with the highest NPV relative to the Base Case.

Table 1: Summary of credible network options

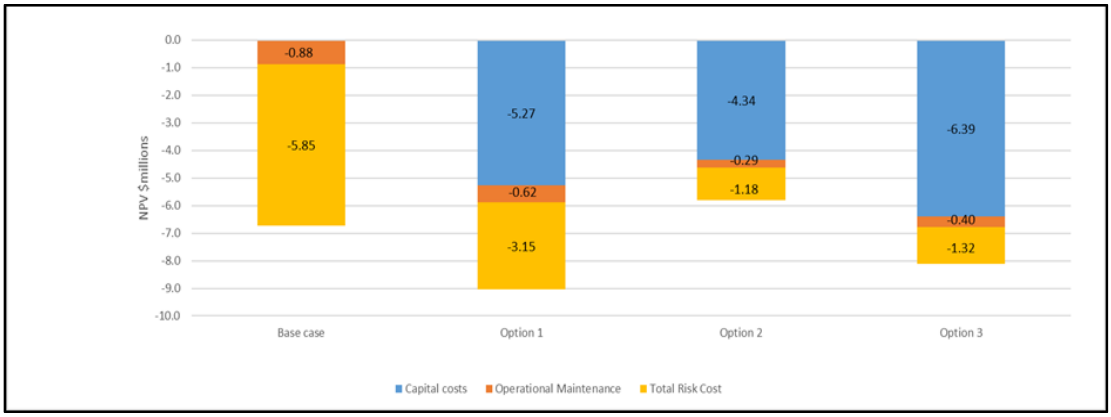
Option	Description	Total Cost ($m) 2018/19	NPV relative to Base Case ($m) 2018/19)	Ranking
Option 1	Repair oil leaks and replace selected components on the two at-risk 80 MVA transformers to address corrosion and emerging reliability issues by June 2022	$3.50*	-2.31	3
	Replace both at-risk 80 MVA 132/66/11kV transformers with a single 160 MVA 132/66/11kV transformer by June 2027	$6.16†		
Option 2	Replace both at-risk 80 MVA 132/66/11kV transformers with a single 160 MVA 132/66/11kV transformer by June 2022	$6.16*	+0.91	1
Option 3	Replace both at-risk 80 MVA 132/66/11kV transformers with two 100 MVA 132/66/11kV transformers by June 2022	$9.09*	-1.39	2

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

It should be noted that Option 1 and 2 result in a changed substation configuration, with the final configuration consisting of two 132/66/11kV transformers (i.e. 2 x 160 MVA transformers; one new and one existing transformer). Option 3 maintains the existing configuration consisting of three 132/66/11kV transformers (i.e. 2 x 100MVA new transformers and 1 x 160MVA existing transformer). All options and their resulting configurations continue to provide the required services to the Blackwater area.

From Figure 1 it can be seen that the Base Case and all options have negative absolute NPVs. All options reduce the total risks and maintenance costs arising from the ageing and obsolete assets at Blackwater remaining in service (as in the Base Case), with Option 2 having the largest reduction and reflecting a net economic benefit when compared to the Base Case.

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



Taking into account capital, operational maintenance and risk costs, Option 2 delivers the greatest net economic benefit, providing a positive $0.91 million improvement in NPV terms compared to the Base Case.

Option 2 has been identified as the preferred option.

Of the credible network options, Option 2 has been identified as the preferred option, providing the greatest benefit to customers.

The RIT-T project for Option 2 involves replacing the two 132/66/11kV 80 MVA transformers with one 132/66/11 kV 160MVA transformer by June 2022. The indicative capital cost of the RIT-T project for the preferred option is $6.16 million in 2018/2019 prices.

Under Option 2, design work will commence in late 2019, with installation of the new transformer completed by June 2022.

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 2022, on an ongoing basis.

A non-network option that avoids the proposed replacement of the ageing transformers would need to replicate, in part or full, the support that Blackwater 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 Tuesday, 27 August 2019, particularly on the credible options presented[4].

Please address submissions to:

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[4] 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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