Powerlink Queensland

Summary
Project Specification Consultation Report

29 October 2018

Maintaining power transfer capability and reliability of supply at Bouldercombe Substation

Summary

Located approximately 19 kilometres south-west of Rockhampton and established in 1975, Bouldercombe Substation is a major transmission node for Central Queensland, marshalling a number of 275kV circuits from Nebo and Broadsound to the north, Stanwell in the west and Raglan and Calliope River to the south.

It also provides the sole 132kV injection source for the area, supplying Ergon Energy at Rockhampton, Egans Hill and Pandoin, as well as Stanwell Power Station's auxiliary supply and customers directly connected to Powerlink's network.

Transformers 1 and 2, along with the original circuit breakers, disconnectors, earth switches and instrument transformers at Bouldercombe Substation are nearing the end of their technical service lives, with manufacturers no longer providing technical support or carrying spares for many of the items.

Powerlink's obligations as a Transmission Network Supply Provider (TNSP)[1] require it to maintain (including repair and replace if necessary) its transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity, including the ability to meet peak demand if a major element of the network was to fail.

The increasing likelihood of faults arising from the ageing and obsolete plant at Bouldercombe Substation remaining in service, presents Powerlink with a range of operational and safety risks, as well as compliance issues, requiring resolution.

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

This investment is driven by an obligation under the Rules, and is classified as a 'reliability corrective action' under the RIT-T.

Credible options

Powerlink has developed six credible options to address the identified need.

A Base Option reflecting a minimalist approach to ensuring continued compliance with Powerlink's reliability of supply obligations has been compared with five other options in which one of two transformers of differing capacity is paired with a range of primary plant replacement and life extension strategies.

Table 1: Summary of credible options

Option	Description	Indicative capital cost ($million, 2018/9)	Indicative annual O&M costs ($million, 2018/19)
Base Option Standard 250MVA transformer with staged replacement of primary plant by December 2031	Install a new 250MVA transformer Decommission Transformers 1 & 2 Life extend or replace selected primary plant by December 2021*	26.77*	0.14
	Replace balance of ageing plant by December 2031†	16.96†	
Option 1 Standard 250MVA transformer with staged replacement of primary	Install a new 250MVA transformer, decommission transformers 1 & 2, life extend or replace selected primary plant by December 2021*	26.98*	0.14

[1] Schedule 5.1a System Standards and 5.1.2 Network Reliability of the Rules, Electricity Act 1994 and Queensland Transmission Authority T01/98

Option	Description	Indicative capital cost ($million, 2018/9)	Indicative annual O&M costs ($million, 2018/19)
plant by December 2041	Replace balance of ageing plant by December 2041†	15.95†	
Option 2 Install standard 250MVA transformer with upfront replacement of all primary plant in selected bays by December 2021	Install a new 250MVA transformer, decommission transformers 1 & 2 and single stage replacement of all plant in selected bays by December 2021*	30.60*	0.12
Option 3 Standard 375MVA transformer with staged replacement of primary plant by December 2031	Install a new 375MVA transformer, decommission transformers 1 & 2 and life extend or replace selected primary plant by December 2021*	27.28*	0.14
	Replace balance of ageing plant by December 2031†	16.96†	
Option 4 Standard 375MVA transformer with staged replacement of primary plant by December 2041	Install a new 375MVA transformer, decommission transformers 1 & 2 and life extend or replace selected primary plant by December 2021*	27.49*	0.14
	Replace balance of ageing plant by December 2041†	15.95†	
Option 5 Standard 375MVA transformer with upfront replacement of all primary plant in selected bays by December 2021	Install a new 375MVA transformer, decommission transformers 1 & 2 and single stage replacement of all primary plant in selected bays by December 2021*	31.12*	0.12

*Proposed RIT-T project
†Modelled project

Powerlink has also considered whether non-network options could address the identified need. A non-network option that avoids replacement of the ageing primary plant would need to replicate the support that Bouldercombe Substation provides the Powerlink and Ergon Energy networks in meeting the Rule's reliability obligations on an enduring basis.

Powerlink welcomes submissions from potential proponents who consider that they could offer a credible non-network option that is both economically and technically feasible.

Option 2 has been identified as the preferred option

Option 2 has been identified as the preferred option for addressing the risks arising from the ageing transformers and primary plant at Bouldercombe Substation.

Due to the nature of the investment, none of the credible options considered, including the preferred option, are expected to give rise to material market benefits.

Table 2 shows the net present value (NPV) of all options.

Table 2: NPV of credible options (NPV, $m 2018/19)

Option	Weighted NPV	Ranking
Base Option	-35.2	5
Option 1	-30.8	3
Option 2	-29.0	1
Option 3	-35.7	6
Option 4	-31.3	4
Option 5	-29.4	2

Powerlink has identified Option 2 as the preferred option for the following reasons:

- lowest cost in NPV terms
- sufficient capacity for load growth
- minimum number of mobilisations to site of technical staff compared to staged options.

Under the preferred option, design work will commence in early 2020, with preparatory construction activities occurring on-site in late 2020. Completion of the work is scheduled for December 2021.

The indicative capital cost of this option is $30.6 million in 2018/19 prices.

Submissions

Powerlink welcomes written submissions on this *Project Specification Consultation Report*. Submissions are particularly sought on the credible options presented.

Submissions are due on or before Friday, 25 January 2019.

Please address submissions to:

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