



Powerlink Queensland

Summary Project Specification Consultation Report

29 October 2018

Maintaining power transfer capability and reliability of supply at Ross Substation

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Summary

Ageing and obsolete primary plant at Ross Substation require Powerlink to take action

Ross Substation was first established in the 1983 and is an essential switching station for 275kV power transfer from central to north and far north Queensland, as well as the major injection point for the Townsville area distribution network. Three 275/132kV transformers provide the bulk supply of electricity to Townsville and the surrounding area via Powerlink substations at Townsville South, Millchester, Alan Sherriff, Dan Gleeson, Kidston and Yabulu South.

At over 35 years of age, much of the substation's primary plant is reaching the end of its technical service life and is no longer supported by the manufacturer, with few spares available.

The increasing likelihood of faults arising from Ross Substation's ageing and obsolete primary plant remaining in service, places the network at risk of being unable to meet current and forecast energy demands.

Powerlink's obligations as a Transmission Network Service Provider (TNSP) 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 increased likelihood of faults combined with its TNSP obligations present Powerlink with a number 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.

Three credible options have been formulated to address the identified need

The Base Option reflects a conventional replacement strategy that seeks to maximise the life of the existing plant while ensuring continued compliance with the Rules and serves as the basis of comparison between options. This approach involves the refurbishment of the existing earth switches and disconnectors by October 2024, along with the replacement of selected ageing and obsolete 132kV and 275kV circuit breakers, surge arrestors and current and voltage transformers in two stages by October 2024 and October 2038.

This has then been compared with two other credible network options.

Option 1 involves the same two stage replacement of the ageing and obsolete 132kV and 275kV plant as the Base Option, but with the addition of new circuit breakers for transformer 4 and feeder 8858, as well as the replacement of the existing live tank circuit breaker on the Static Var Compensator (SVC) with a dead tank circuit breaker (DTB) in 2024. As in the Base Option, the existing earth switches and disconnectors are refurbished by October 2024.

Option 2 involves the upfront replacement of all of the ageing and obsolete 275kV primary plant, including the existing earth switches and disconnectors, by October 2024 and the same two stage replacement of the ageing and obsolete 132kV plant by October 2038.

All options are designed to provide the Townsville area with a reliable, cost effective supply and ensure that the switching capabilities of the substation are maintained on an ongoing basis.

A summary of the credible options is given in Table 1.

Table 1: Summary of credible primary plant options

Option	Description	Indicative project costs (\$million, 2018/19)	Indicative annual average O&M costs (\$million, 2018/19)
Base Option	Refurbishment of selected earth switches and disconnectors by October 2024 [#]	3.43 [#]	
	Two stage replacement of selected 132kV and 275kV primary plant by October 2038, including 16 dead tank circuit breakers	22.63*	0.16
	Replacement of remaining ageing and obsolete 132kV and 275kV plant by October 2038 [†]	10.82 [†]	
Option 1	Refurbishment of selected earth switches and disconnectors by October 2024 [#]	3.43 [#]	
	Two stage replacement of selected 132kV and 275kV primary plant by October 2038, including 20 dead tank circuit breakers	22.66*	0.16
	Replacement of remaining ageing and obsolete 132kV and 275kV plant by October 2038 [†]	11.45 [†]	
Option 2	Upfront replacement of all ageing and obsolete 275kV plant by October 2024 [*]	13.16*	
	Replacement of selected 132kV equipment by October 2024 [*]	11.21*	0.14
	Replacement of remaining ageing and obsolete 132kV plant by October 2038 [†]	2.29 [†]	

[#]Modelled operational project

^{*}Proposed RIT-T project

[†]Modelled capital 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 Ross Substation provides Powerlink and Ergon Energy in meeting their reliability of supply obligations on an enduring basis at a cost that is lower than the network options under consideration.

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.

Due to the nature of the investment, none of the credible options considered are expected to give rise to material market benefits. The major differences between the options relate to their capital costs, the technology employed and timing.

The net present value (NPV) analysis demonstrates that Option 2 provides the lowest cost solution.

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

Option	NPV (\$m)	Ranking
Base option	-24.69	2
Option 1	-24.84	3
Option 2	-21.17	1

Powerlink recommends the Option 2 for the following reasons:

- lowest cost in NPV terms
- optimised life of existing plant.

The staged approach of this option also allows for a review of the condition of the plant prior to each stage to reassess the need for remedial action at that point in time.

Ross substation is a large and critical substation for the supply of electricity to the Townsville area and more broadly into north Queensland. The long lead time for this project allows for the staging of the complex outage plans associated with this project and the efficient co-ordination of these outages with other projects in the Townsville area. Under Option 2, design work will commence in mid-2019. Installation of the new circuit breakers and selected primary plant will be completed by October 2024.

The indicative capital cost of this option, including modelled future works, is \$26.66 million in 2018/19 prices. The indicative capital cost of the RIT-T project for the preferred option is \$24.37 million.

Powerlink will:

- review and refine the timing of subsequent stages as required at a later date based on future condition assessments of the risks arising from those assets remaining in service
- undertake any necessary additional regulatory consultations at the appropriate time for future investments if required

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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