



Powerlink Queensland

Summary of Project Specification Consultation Report

14 December 2018

Amended as per 14 /12/2018 Addendum

Addressing the secondary systems condition risks at Woree Substation

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Summary

Ageing and obsolete secondary systems at Woree Substation require Powerlink to take action

Located 6km south of the Cairns Central Business District, Woree Substation is the major 132kV injection point into the Ergon Energy distribution network for Cairns. It also forms part of the far-north zone transmission network, with direct connection to Chalumbin Substation.

As part of its configuration and role, the substation contains a Static Var Compensator (SVC), which helps improve the transfer of electricity across the network by reducing transmission losses, smoothing voltage fluctuations and stabilising power flows.

The secondary systems associated with the SVC and most of the standard substation 132kV and 275kV secondary systems at Woree Substation are reaching the end of their technical service lives, and are no longer supported by the manufacturer, with few spares available.

Secondary systems are the control, protection and communications equipment that are necessary to operate the transmission network and prevent damage to primary systems and SVCs when adverse events occur.

Under the National Electricity Rules ('the Rules'), Transmission Network Service Providers (TNSPs) are required to provide sufficient secondary systems, including redundancies, to ensure the transmission system is protected.

This increased likelihood of faults arising from the ageing and obsolete secondary systems at Woree Substation remaining in service, combined with its TNSP obligations, present Powerlink with a range of operational risks and 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.

Four credible options have been identified to address the need

Table 1: Summary of credible options

| Option | Description | Indicative capital cost (\$million, 2018/19) | Indicative average annual operating and maintenance costs (\$million, 2018/19) |
|--|---|--|--|
| Base Case | | | |
| Replacement of all SVC secondary systems by December 2022 | Replace all panels by December 2022* | 5.28* | |
| Staged replacement of substation secondary systems in 1 new building and existing buildings by December 2033 | Replace selected panels by: December 2022* December 2025† December 2028† December 2033† | 6.01* 3.43† 3.03† 0.96† | 0.11 |
| Option 1 | | | |
| Replacement of all SVC secondary systems by December 2022 | Replace all panels by December 2022* | 5.28* | |
| Staged replacement of substation secondary systems in 1 new building and existing buildings by December 2028 | Replace selected panels by: December 2022* December 2028† | 9.41* 3.95† | 0.11 |

| | | | |
|---|--------------------------------------|--------|------|
| Option 2 | | | |
| Replacement of all SVC secondary systems by December 2022 | Replace all panels by December 2022* | 5.28* | |
| Upfront replacement of all secondary systems into 2 new buildings and existing buildings by December 2022 | Replace all panels by December 2022* | 14.46* | 0.07 |

*Proposed RIT-T project

†Modelled projects

The Base Option reflects a conventional approach to ensuring continued compliance with the secondary systems obligations in the Rules and has been selected to serve as the basis of comparison between options. Due to space limitations in the existing buildings at Woree, the Base Option requires the addition of a new building.

This option has then been compared with two other options in which the ageing secondary systems are replaced using a variety of building options and completion dates.

Powerlink has also considered whether non-network options could address the identified need. A non-network option that avoids replacement of secondary systems would need to replicate the support that Woree Substation provides Powerlink and Ergon in meeting their reliability 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.

Base Option has been identified as the preferred option

Due to the nature of the investment, none of the options considered, including the preferred option, are expected to give rise to market benefits. The difference between the options relates primarily to differences in capital costs and timing. The net present value (NPV) analysis demonstrates the Base Option is the lowest cost option. (Refer to Table 2)

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

| Option | Central Scenario NPV (\$m) | Ranking |
|-------------|----------------------------|---------|
| Base Option | -11.16 | 1 |
| Option 1 | -11.83 | 2 |
| Option 2 | -13.47 | 3 |

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

- lowest cost in NPV terms
- maximised life of current equipment

Under the Base Option design and procurement work for the RIT-T project will commence in late 2021 for the SVC secondary systems and in mid-2022 for the 132kV and 275kV secondary systems. Commissioning of the Base Option will be completed by December 2022.

The indicative capital cost of the RIT-T project for the preferred option is \$11.29 million in 2018/19 prices.

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 15 March 2019.

Please address submissions to:

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