



Powerlink Queensland

Summary Project Assessment Draft Report

23 April 2019

Maintaining reliability of supply at Kamerunga Substation

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Summary

Introduction

Located approximately 10 kilometres north-west of Cairns, Kamerunga Substation, established in 1976, is a major injection point into the Ergon Energy distribution network. Planning studies have confirmed there is an enduring need for the substation to maintain the supply of electricity in the Cairns area.

Both the primary plant and secondary systems at Kamerunga Substation are nearing the end of their technical service lives with identified condition and obsolescence issues. The substation is also susceptible to major flooding events which could result in damage to equipment leading to loss of supply.

The condition of the primary plant and secondary systems at Kamerunga substation, along with the existing flood risk, exposes customers to the risks and consequences of an increasingly unreliable electricity supply.

There is a need for Powerlink to address this emerging risk to ensure customers in the area continue to receive safe, reliable and cost effective electricity services into the future and to meet mandated jurisdictional and National Electricity Rules' (the Rules) obligations.

This Project Assessment Draft Report (PADR) has been prepared as part of a prescribed process under the National Electricity Rules (the Rules) for the proposed transmission investment. It contains the results of the planning investigation and cost benefit analysis of credible options, identifying the proposed preferred option for implementation in accordance with the Australian Energy Regulator's (AER's) Regulatory Investment Test for Transmission (RIT-T).

Options considered

Powerlink published a Project Specification Consultation Report (PSCR) with respect to maintaining reliability of supply at Kamerunga Substation to Registered Participants, the Australian Energy Market Operator (AEMO) and interested parties in September 2018. The PSCR invited submissions of credible options to replicate the services that the Kamerunga Substation provides to customers in the Cairns area, while maintaining the Rule's reliability obligations on an enduring basis.

No submissions were received in response to the PSCR that closed for consultation on 21 December 2018. As a result, no additional credible options (network or non-network) have been identified as part of the PSCR stage of this RIT-T consultation.

Powerlink proposed four credible network options in the PSCR to meet the identified need at Kamerunga Substation.

A Base Option reflecting a conventional approach to ensuring continued compliance with the secondary systems obligations in the Rules, along with a staged replacement of primary plant, serves as the basis of comparison between options. This approach involves a full secondary systems equipment replacement, housed in a new prefabricated building, and the staged replacement of selected primary plant over an eight year period.

This option has then been compared with three other options in which the secondary systems are all fully replaced in a single stage and the primary plant replaced with either the current Air Insulated Switchgear (AIS) technology, or an alternative Gas Insulated Switchgear (GIS) technology, in a single stage.

Evaluation and Conclusion

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

The difference between the options relates primarily to the type of technology utilised, the timing of the primary plant replacement, and the way in which each option addresses potential Woree feeder trips and flood risk.

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

The credible network options and their net present value (NPV) are summarised in Table 1.

Table 1: Summary of credible network options

Option	Description	Capital cost (\$m 2018/19)	Weighted NPV (\$m 2018/19)	Ranking
Base Option	Single stage secondary system replacement. Staged AIS primary plant replacement. Flood operable by October 2028	26.70	-22.03	3
Option 1	Single stage secondary system replacement. Single stage AIS primary plant replacement. Flood operable by October 2022	23.20	-22.21	4
Option 2	Single stage secondary system replacement. Single stage GIS primary plant replacement including additional switching functionality. Flood operable by October 2022	24.62	-21.41	1
Option 3	Single stage secondary system replacement. Single stage AIS primary plant replacement including additional switching functionality. Flood operable by October 2022	23.75	-21.45	2

The economic analysis shows only \$0.04 million difference between the NPV of Options 2 and 3, which represents less than 0.2% of the estimates for these options, well within the expected margin of accuracy. Given this, Options 2 and 3 are considered equal as the highest ranked options in economic terms.

This PADR includes a draft recommendation to implement Option 3 as it:

- satisfies the RIT-T based on the cost benefit analysis (i.e. equal lowest cost in NPV terms with consideration for estimating accuracy)
- utilises existing technology within the Powerlink network, removing the need to acquire new spares and undertake additional training for personnel (compared to Option 2)
- addresses the risk to electricity supply from flood inundation in a single construction phase at the current Kamerunga Substation site by October 2022
- provides increased security of supply through the inclusion of circuit breakers (CBs) on the Woree feeders

Option 3 involves replacing Kamerunga's current primary plant with new AIS equipment, installing additional circuit breakers for the Woree feeders and the full replacement of all secondary systems in a new building. All primary plant and secondary systems are to be located above the 1 in 200 year flood level. Design work would commence in early 2020, with preparatory construction activities occurring on-site in late 2020. All work would be completed by October 2022. The indicative capital cost of this option is \$23.75 million in 2018/19 prices.

Submissions

Powerlink welcomes written submissions on this 'Project Assessment Draft Report'. Submissions are particularly sought on the credible options presented.

Submissions are due on or before Friday, 7 June 2019.

Please address submissions to:

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