

Powerlink Queensland



Summary of Project Assessment Conclusions Report

6 July 2020

Addressing the secondary systems condition risks in the Gladstone South area

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Executive Summary

Gladstone South Substation, located approximately 5km southeast of the Gladstone CBD, was established in the early 1960s as a 132kV injection point for the 66kV regional distribution network owned by Ergon Energy (part of the Energy Queensland Group). A second interconnected 132kV substation was established on an adjacent site in 2002 to meet a growing demand for electricity in the local area.

The QAL West Substation, also established in 2002, is one of three injection points for the Queensland Aluminium (QAL) refinery in Gladstone.

Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Gladstone South and QAL West Substations to support a diverse range of customer needs in the area.

The secondary systems at Gladstone South and QAL West Substations broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring. Commissioned almost 20 years ago, most of these systems are reaching the end of their technical service lives and are no longer supported by the manufacturer, with limited spares available. Increasing failure rates, along with the increased time to rectify the faults due to the obsolescence of the equipment significantly affects the availability and reliability of these systems and their ability to continue to meet the requirements of the National Electricity Rules (the Rules).

Powerlink must therefore address the emerging risks arising from the condition of the secondary systems at Gladstone South and QAL West Substations. As the identified need of the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority and guidelines and standards published by the Australian Energy Market Operator (AEMO), and to ensure Powerlink's ongoing compliance with Schedule 5.1 of the Rules, it is classified as a 'reliability corrective action'¹.

This Project Assessment Conclusions Report (PACR) represents the final step in the RIT-T process prescribed under the Rules undertaken by Powerlink to address the condition risks arising from the secondary systems at Gladstone South and QAL West Substations. It contains the results of the planning investigation and the cost-benefit analysis of the credible option compared to a non-credible Base Case where the emerging risks are left to increase over time. In accordance with the RIT-T, the credible option that minimises the net present value (NPV) of costs is recommended as the preferred option.

Credible options considered

Powerlink developed two credible network options to maintain the existing electricity services, ensuring an ongoing reliable, safe and cost effective supply to customers in the area. The major difference between the credible options relates to the staging of the Gladstone South works.

By addressing the condition risks, both options allow Powerlink to meet the identified need and continue to meet the reliability and service standards specified within Powerlink's Transmission Authority, Schedule 5.1 of the Rules, AEMO guidelines and standards and applicable regulatory instruments.

Powerlink published a Project Specification Consultation Report (PSCR) in February 2020 to address the risks and obsolescence issues arising from the condition of the secondary systems at Gladstone South and QAL West Substations. No submissions were received in response to the PSCR that closed on 22 May 2020. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

The two credible network options, along with their NPVs relative to the Base Case are summarised in Table 1. Both options have a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'. Of the two credible network options, Option 2 has the lowest cost in NPV terms.

¹ The Rules clause 5.10.2, Definitions, reliability corrective action.

NOTE. This RIT-T commenced under Version 132 of the Rules in February 2020.

Table 1: Summary of credible network options

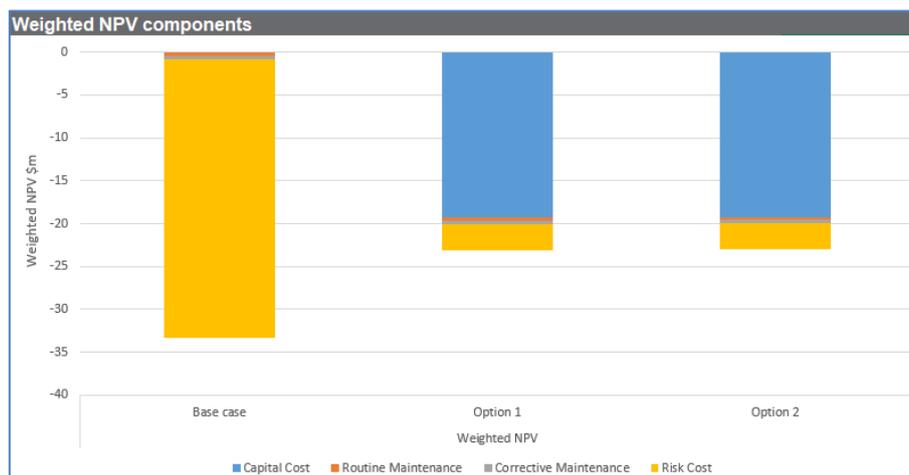
Option	Description	Capital costs (\$m) 2019/20	Weighted NPV relative to Base Case (\$m)	Ranking
1	Gladstone South: Partial replacement of secondary systems equipment using a new prefabricated building by April 2024*	15.9*	10.3	2
	Partial replacement of secondary systems equipment by October 2030†	2.3†		
	QAL West: Replace all secondary systems using existing building by April 2024*	6.8*		
2	Gladstone South: Full replacement of all secondary systems using a new prefabricated building by April 2024*	17.0*	10.4	1
	QAL West: Replace all secondary systems using existing building by April 2024*	6.8*		

* RIT-T Project

†Future modelled projects

Figure 1 shows the absolute NPVs of the Base Case and the credible network options. All credible options significantly reduce the total risks arising from the condition of the ageing and obsolete secondary systems at Gladstone South and QAL West Substations when compared to the Base Case. Option 2 has the highest NPV of the credible options.

Figure 1: Weighted NPV of Base Case and Credible Network Options



Evaluation and Conclusion

The RIT-T requires that the proposed preferred option maximises the present value of net economic benefit, or minimises the net cost, to all those who produce, consume and transport electricity. The economic analysis demonstrates that Option 2 provides the lowest cost solution and is therefore the preferred option.

In accordance with the expedited process for the RIT-T, the PSCR made a draft recommendation to implement Option 2, the full replacement of all secondary systems at both Gladstone South and QAL West substations by April 2024. The indicative capital cost of this option is \$23.8 million in 2019/20 prices. Powerlink is the proponent of this network option.

Design work will commence in 2020 and construction will commence in 2022. Installation and commissioning of the new secondary systems will be completed by April 2024.

As the outcomes of the economic analysis contained in this PACR remain unchanged from those published in the PSCR, the draft recommendation has been adopted without change as the final recommendation, and will now be implemented.



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