

Powerlink Queensland



Summary of Project Assessment Conclusions Report

17 August 2020

Addressing the secondary systems condition risks at Cairns

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Summary

Cairns Substation was established in the mid-1950s, as the principal connection point for all 132kV circuits in the Cairns area. In 2002, Woree Substation was established, which allowed the Cairns Substation to be rebuilt with a reduced configuration. It now acts as the major injection node for the southern section of the Cairns 22kV network, which is supplied via Ergon Energy (part of the Energy Queensland Group).

Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Cairns Substation.

The secondary systems at Cairns Substation broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring.

Installed almost 20 years ago, most secondary systems at the substation 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 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 Cairns Substation. 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 Cairns Substation. It contains the results of the planning investigation and the cost-benefit analysis of credible options 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 has 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 whether the secondary systems are replaced in-situ in the existing building, or utilise a new prefabricated building.

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 or the Rules, AEMO guidelines and standards and applicable regulatory instruments.

Powerlink published a Project Specification Consultation Report (PSCR) in May 2020 to address the risks and obsolescence issues arising from the condition of the secondary systems at Cairns Substation. No submissions were received in response to the PSCR that closed on 31 July 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.

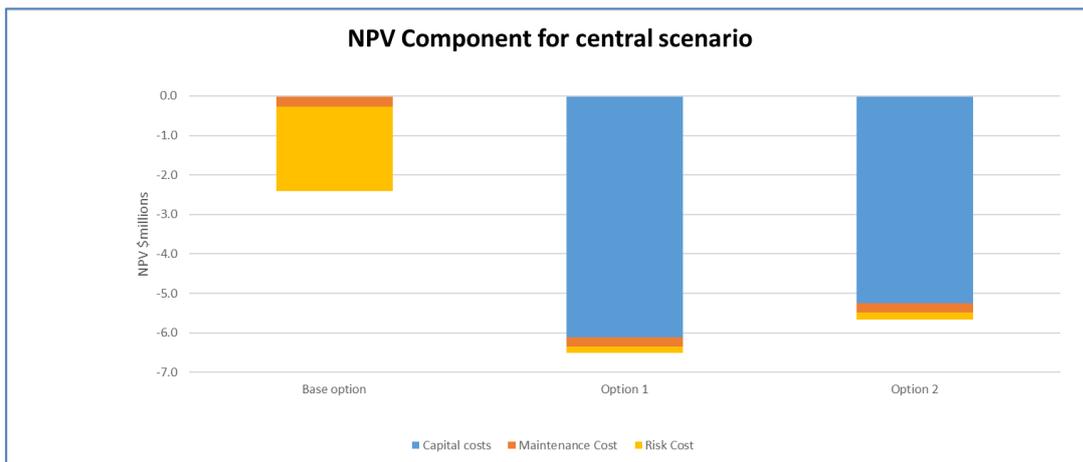
¹ The Rules clause 5.10.2, Definitions, reliability corrective action.

Table 1: Summary of credible network options

Option	Description	Total costs (\$m) 2019/20	NPV relative to Base Case (\$m)	Ranking
Option 1 Replacement in existing building	Replacement of secondary systems into new panels in the existing building by December 2024	9.14	-4.11	2
Option 2 Replacement in new building	Replacement of secondary systems in a new demountable building by December 2024	7.84	-3.25	1

The absolute NPVs of the Base Case and the credible options are negative, shown graphically in Figure 1, with Option 2 being the least negative of the credible options. Both options significantly reduce the total risks arising from the condition of the ageing and obsolete secondary systems at Cairns remaining in service, enabling Powerlink to continue to meet reliability and service standards specified within its Transmission Authority. They also ensure Powerlink’s ongoing compliance with Schedule 5.1 of the Rules and guidelines and standards published by the Australian Energy Market Operator (AEMO).

Figure 1: NPV of Base Case and Options (\$m, 2019/20)



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, which involves the replacement of the secondary systems at Cairns in a new building by December 2024. The indicative capital cost of this option is \$7.84 million in 2019/20 prices. Under Option 2, initial design work will commence in mid-2021, followed by fabrication of the new building and panels in mid-2023, with all work completed by December 2024. Powerlink is the proponent of the proposed network project.

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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