

Powerlink Queensland



# Summary of Project Assessment Conclusions Report 24 August 2022

## Addressing the secondary systems condition risks at Chalumbin

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## Executive Summary

Chalumbin Substation is located almost 100 kilometres to the south of Cairns in Far North Queensland (FNQ). The site was established in 1988 to help supply load into the Cairns and Atherton Tableland areas. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by this substation.

The secondary systems at Chalumbin broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring. The majority of Chalumbin's 275kV secondary systems will reach the end of their technical service lives between 2024-2026, with only limited manufacturer support and spares available at this time.

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 Chalumbin 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'<sup>1</sup>.

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 Chalumbin 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 four 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 one or two stages, within the existing building, or in a new prefabricated building.

By addressing the condition risks, all 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) on 5 April 2022 to address the risks and obsolescence issues arising from the condition of the secondary systems at Chalumbin Substation. No submissions were received in response to the PSCR that closed on 8 July 2022. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

The four credible network options, along with their NPVs relative to the Base Case are summarised in Table 1. All options have a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'. Of the four credible network options, Option 4 has the lowest cost in NPV terms.

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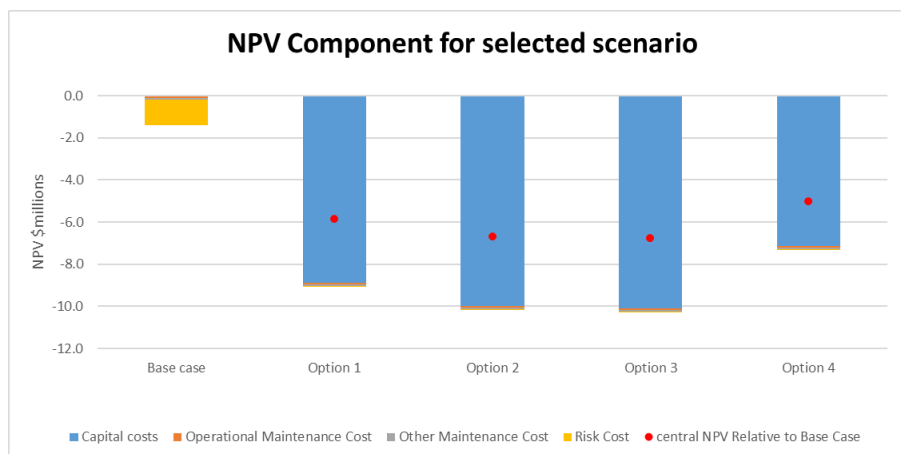
<sup>1</sup> The Rules clause 5.10.2, Definitions, reliability corrective action.

Table 1: Summary of credible network options

Option	Description	Total costs (\$m, 2022)	NPV relative to Base Case (\$m, 2022)	Ranking
1	Two stage replacement of selected 275kV secondary systems into new panels in the existing building with all works completed by December 2026	12.80	-7.67	2
2	Two stage replacement of selected 275kV secondary systems into a new demountable building with all works completed by December 2026	14.30	-8.77	3
3	Single stage replacement of selected 275kV secondary systems into a new demountable building by December 2025	13.72	-8.87	4
4	Single stage replacement of selected 275kV secondary systems into new panels in the existing building by December 2025	9.71	-5.93	1

The absolute NPVs of the Base Case and the credible options are negative, shown graphically in Figure 1, with Option 4 being the least negative of the credible options. All options significantly reduce the total risks arising from the condition of the ageing and obsolete secondary systems at Chalumbin 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 credible network options (\$m, 2021/22)



### Evaluation and Conclusion

The RIT-T requires that the 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 4 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 4, which involves the single stage replacement of selected 275kV secondary systems into new panels in the existing building by December 2025. The indicative capital cost of this option is \$9.71 million in 2021/22 prices. Under Option 4, design work will commence in 2022, with the installation and commissioning of the new secondary systems completed by December 2025. Powerlink is the proponent of this 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 as the final recommendation, and will now be implemented.



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