

Powerlink Queensland



Summary of Project Assessment Conclusions Report

6 April 2020

Addressing the secondary systems condition risks at Mt England Substation

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Summary

Mt England Substation is a 275kV switching station located approximately 40km north-west of the Brisbane Central Business District. It was established in 1983 to provide a connection point for Wivenhoe Power Station and facilitate the flow of energy from Tarong Power Station into the greater Brisbane transmission network via feeders to South Pine, Blackwall and Abermain Substations. Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services provided by Mt England Substation.

The secondary systems at Mt England broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring. Many of these systems are reaching the end of their technical service lives, and are increasingly no longer supported by their 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, reliability and technical capability of these systems 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 Mt England 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 275kV secondary systems at Mt England Substation. 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.

Proposed network option to address the identified need

Secondary systems have a very specific and important role in protecting, controlling and monitoring the transmission network, with the form and capabilities of much of these systems defined in the Rules and the AEMO standards and guidelines. Consequently, the only technically and economically prudent network option to address the secondary system condition risks and compliance obligations at Mt England Substation by October 2023 is to replace the secondary systems.

Powerlink has presented the least cost variant of this option.

The proposed credible network option, along with its NPV relative to the Base Case is summarised in Table 1 below. The absolute NPVs of the Base Case and the credible network option are shown graphically in Figure 1.

Table 1 illustrates that the credible network option has a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'.

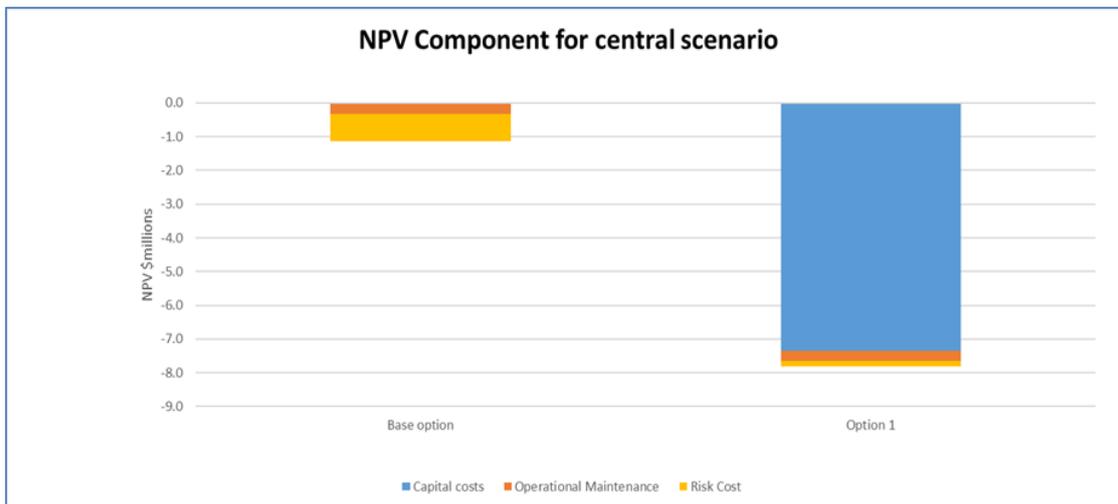
Table 1: Summary of the credible network option

| Option | Description | Total costs (\$m) 2019/20 | NPV relative to base case (\$m) 2019/20 |
|--------|--|---------------------------------|--|
| 1 | Replacement of selected 275kV secondary systems within the existing building by October 2023 | 10.26 | -6.69 |

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

Figure 1 shows that the Base Case and the credible option both have a negative NPV, with the network option significantly reducing the risks arising from the condition of the ageing and obsolete secondary systems at Mt England when compared to the Base Case.

Figure 1: NPV of Base Case and Credible Network Option



The Base Case is not a credible option, in that it does not allow Powerlink to continue to maintain compliance with relevant standards, applicable regulatory instruments and the Rules. As the investment is classified as a 'reliability corrective action' under the Rules, the purpose of the RIT-T is to identify the credible option that minimises the total cost to customers.

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. As no non network submissions were received, the proposed network option 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 the proposed network option, which involves replacement of selected 275kV secondary systems within the existing building by October 2023. The indicative capital cost of this option is \$10.26 million in 2019/20 prices, with design work to commence in mid-2020 and installation and commissioning of the new secondary system to be completed by October 2023.

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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