Powerlink Queensland

Summary of Project Assessment Conclusions Report

2 March 2022

Addressing the secondary systems condition risks at Innisfail

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Executive Summary

Innisfail Substation is located approximately 70 kilometres south-east of Cairns in Far North Queensland (FNQ). The site was originally established in the late 1950s as part of the Kareeya Hydro Power Station project to provide electricity to coastal communities in the area. It continues today as a 132/22kV bulk supply point for Energy Queensland's distribution network for the Innisfail area.

Planning studies have confirmed there is a long-term requirement to continue to supply the existing electricity services currently provided by Innisfail Substation to customers in Far North Queensland. The secondary systems at Innisfail Substation broadly perform the functions of transmission element protection, data collection, remote (and local) control and monitoring.

Many of the current systems were installed in 2003 and are reaching the end of their technical service lives, with respective manufacturers slowly withdrawing support and 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 Innisfail 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 Innisfail 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, within 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) on 30 November 2020 to address the risks and obsolescence issues arising from the condition of the secondary systems at Innisfail Substation. No submissions were received in response to the PSCR that closed on 5 March 2021. As a result, no additional credible options have been identified as a part of this RIT-T consultation.

Following the conclusion of the PSCR, Powerlink completed detailed project planning and coordination with a very large and complex program of works in FNQ. This has identified that the program can only efficiently deliver the works under either option by 2027; not by the required 2024 completion date. Consequently, the cost-benefit analysis has been repeated to reflect the later completion. Risks in the interim will be managed through a flexible response facilitated by the upfront purchase and fabrication of the new secondary systems under this project. Completion of the works will be scheduled in line with network access availability or completed earlier in the event of failure of the existing equipment.

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

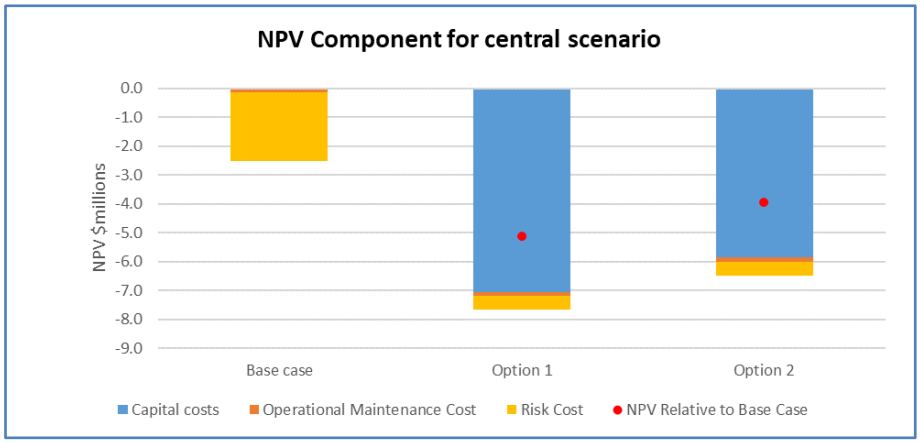
The two credible network options, along with their NPVs relative to the Base Case are summarised in Table 1. Both options have a negative NPV relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'. Of the two credible network options, Option 2 has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

Table 1: Summary of credible network options

Option	Description	Total costs ($m, 2020/21)	NPV relative to base case ($m, 2020/21)
1	Full replacement of all secondary systems within the existing building by December 2027	12.90	-5.13
2	Full replacement of all secondary systems in a new demountable building by December 2027	11.63	-3.95

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 Innisfail 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, 2020/21)



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 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 involved the full replacement of all secondary systems at Innisfail Substation in a new building by December 2024, which has been updated to December 2027 in this PACR. The indicative capital cost of this option is $11.63 million in 2020/21 prices. Under Option 2, design work will commence in 2022, with the installation and commissioning of the new secondary systems completed by December 2027. 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 as the final recommendation, and will now be implemented.

Contact us

Registered office	33 Harold St Virginia Queensland 4014 Australia
Postal address:	GPO Box 1193 Virginia Queensland 4014 Australia
Contact:	Roger Smith Manager Network and Alternate Solutions
Telephone	(+617) 3860 2328 (during business hours)
Email	networkassessments@powerlink.com.au
Internet	www.powerlink.com.au