

Powerlink Queensland



Summary

Project Specification Consultation Report

5 May 2020

Addressing the secondary systems condition risks at Cairns

Disclaimer

While care was taken in preparation of the information in this document, and it is provided in good faith, Powerlink accepts no responsibility or liability (including without limitation, liability to any person by reason of negligence or negligent misstatement) for any loss or damage that may be incurred by any person acting in reliance on this information or assumptions drawn from it, except to the extent that liability under any applicable Queensland or Commonwealth of Australia statute cannot be excluded. Powerlink makes no representation or warranty as to the accuracy, reliability, completeness or suitability for particular purposes, of the information in this document.

Summary

Ageing and obsolete secondary systems at Cairns Substation require Powerlink to take action

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 Cairns 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).

In addition to the site-specific impacts of obsolescence at Cairns substation, it is also important to note the compounding impact of equipment obsolescence occurring across the fleet of secondary systems assets installed in the Powerlink network. Running multiple secondary systems to failure across the network increases the likelihood of concurrent systemic faults with significant implications for network reliability and safety.

Powerlink is required to apply the RIT-T to this investment

As the identified need for 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.

The most expensive credible network option identified in this PSCR meets the capital expenditure cost threshold of \$6 million, initiating public consultation under the Rules. Powerlink has adopted the expedited process for this RIT-T², as the preferred option is below \$43 million and is unlikely to result in any material market benefits, other than those arising from a reduction in involuntary load shedding. The reduction in involuntary load shedding under the credible network options is catered for in the risk cost modelling and consequentially represented in the economic analysis of the options.

A non-credible Base Case has been developed against which to compare credible options

Consistent with the Australian Energy Regulator's (AER's) RIT-T Application Guidelines³, the assessment undertaken in this PSCR compares and ranks the net present value (NPV) of credible network options designed to address the emerging risks, relative to a Base Case.

The Base Case is modelled as a non-credible option where the existing condition issues associated with an asset are managed via operational maintenance only, resulting in an increase in risk levels due to deterioration of asset condition and rectification of failures taking longer due to obsolescence issues. These increasing risk levels are assigned a monetary value and added to the ongoing maintenance costs to form the Base Case.

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

² In accordance with clause 5.16.4(z1) of the Rules

³ AER, Application guidelines, Regulatory Investment Test for Transmission, December 2018

Two credible network options have been developed to address the identified need

Powerlink has developed two credible network options to maintain the existing electricity services, ensuring a reliable, safe and cost effective supply to customers in the area.

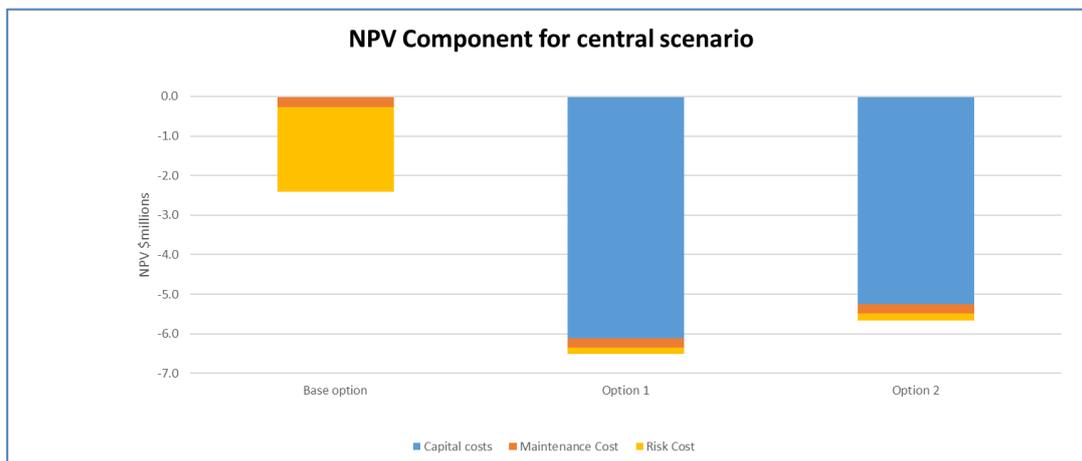
Table 1 details the two credible network options and shows that both options have a negative net present value (NPV) relative to the non-credible Base Case, as allowed for under the Rules for 'reliability corrective actions'. Of the two credible network options, Option 2 has the lowest net economic cost.

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

Figure 1 illustrates that the Base Case and both credible options have negative NPVs, with Option 2 having a lower economic cost compared to Option 1. Both credible options reduce the risk cost compared to the Base Case arising from the condition of the ageing and obsolete secondary systems at Cairns under the Base Case.

Figure 1: NPV of Base Case and Credible Network Options



Option 2 has been identified as the preferred 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.

The economic analysis demonstrates that Option 2 provides the lowest net economic cost of the two credible options and is therefore the preferred option.

Option 2 involves the replacement of the secondary systems at Cairns in a new demountable 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 welcomes the potential for non-network options to form part or all of the solution

Due to the nature of secondary systems, Powerlink is of the view that it is unlikely for there to be an economically and technically feasible non-network option to meet the identified need. However, Powerlink welcomes submissions from proponents who consider they could offer a potential non-network solution by December 2024.

A non-network option that avoids the proposed replacement of the ageing and obsolete secondary systems would need to replicate, in part or full, the support that Cairns Substation delivers to customers in the area on a cost effective basis.

Lodging a submission with Powerlink

Powerlink is seeking written submissions on this Project Specification Consultation Report, on or before Friday, 31 July 2020, particularly on the credible options presented⁴.

Please address submissions to:

Sarah Huang
Acting Manager Network and Alternate Solutions
Powerlink Queensland
PO Box 1193
VIRGINIA QLD 4014
Tel: (07) 3860 2111

Email submissions to: networkassessments@powerlink.com.au

⁴ [Powerlink's website](#) has detailed information on the types of engagement activities, which may be undertaken during the consultation process. These activities focus on enhancing the value and outcomes of the RIT-T engagement process for customers and non-network providers.



Contact us

Registered office	33 Harold St Virginia Queensland 4014 Australia
Postal address:	GPO Box 1193 Virginia Queensland 4014 Australia
Contact:	Sarah Huang Acting Manager Network and Alternate Solutions
Telephone	(+617) 3860 2111 (during business hours)
Email	networkassessments@powerlink.com.au
Internet	www.powerlink.com.au