



Powerlink Queensland

Summary

Project Specification Consultation Report

24 August 2021

Maintaining reliability of supply in the Tarong and Chinchilla local areas

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Summary

Tarong Substation was commissioned in 1982 and forms part of the 275kV backbone servicing South East Queensland, as well as local loads in the Tarong and Chinchilla areas. The Tarong local area load includes auxiliary supply to Tarong Power Station. Chinchilla Substation was commissioned in 1986 to supply bulk electricity to the distribution network in the area, via a double circuit 132kV transmission line from Tarong Substation.

Two 275/66/11kV transformers at Tarong Substation supply the local area load while two 275/132kV transformers provide back-up supply to Chinchilla. All four transformers at Tarong are nearing the end of their respective service lives, with recent condition assessments revealing a range of increasing network and safety risks arising from their continued operation. In addition, the fault level rating of these original transformers may be exceeded in the event of certain credible contingency events.

Chinchilla's secondary systems and the majority of its primary plant are also approaching the end of their respective technical lives. In particular, the secondary systems and circuit breakers are now obsolete and no longer supported by their manufacturers, with only limited spares available.

As planning studies have confirmed an enduring need for the supply of existing electricity services to the area, there is a requirement for Powerlink to address the emerging condition risks in order to maintain compliance with Schedule 5.1 of the Rules, its Transmission Authority and applicable regulatory instruments.

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

The proposed investment is to meet reliability and service standards specified within applicable regulatory instruments and Schedule 5.1 of the Rules and 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.

As the identified need is not discussed in the most recent Integrated System Plan (ISP), it is subject to the application and consultation process for RIT-T projects not defined as *actionable ISP projects*³.

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

Consistent with the Australian Energy Regulator's (AER's) RIT-T Application Guidelines for non-ISP projects, the assessment undertaken in this PSCR compares the net present value (NPV) of the credible network options identified to address the emerging risk-costs of a "do-nothing" Base Case.

The Base Case is modelled as a **non-credible** option where the existing condition and obsolescence issues are managed by undertaking operational maintenance only, which results in an increase in risk levels as the condition and availability of the asset deteriorates over time. The Base Case for the transformers, primary plant and secondary systems at Tarong and Chinchilla, as well as the transmission line between Tarong and Chinchilla includes the costs of work associated with operational maintenance and the risk costs associated with the failure of the assets forms the market costs of the "do nothing" 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 The Rules, clause 5.16.2.

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. Both options retain the opportunity to allow for future growth and potential new connections in the area.

Option 1 maintains the existing topology and includes replacement of all at-risk transformers and primary plant at Tarong and Chinchilla substations and secondary systems at Chinchilla on a like-for-like basis.

Option 2 seeks to optimise the benefits of the 275kV network established to service the Surat Basin. This option involves reconfiguring Chinchilla Substation such that supply is from the Surat Basin network, by replacing selected primary plant and secondary systems and replacing only two of the four transformers at Tarong. The Chinchilla to Tarong transmission line will be mothballed under this option.

Details of each option are summarised in Table 1.

Table 1: Summary of credible options

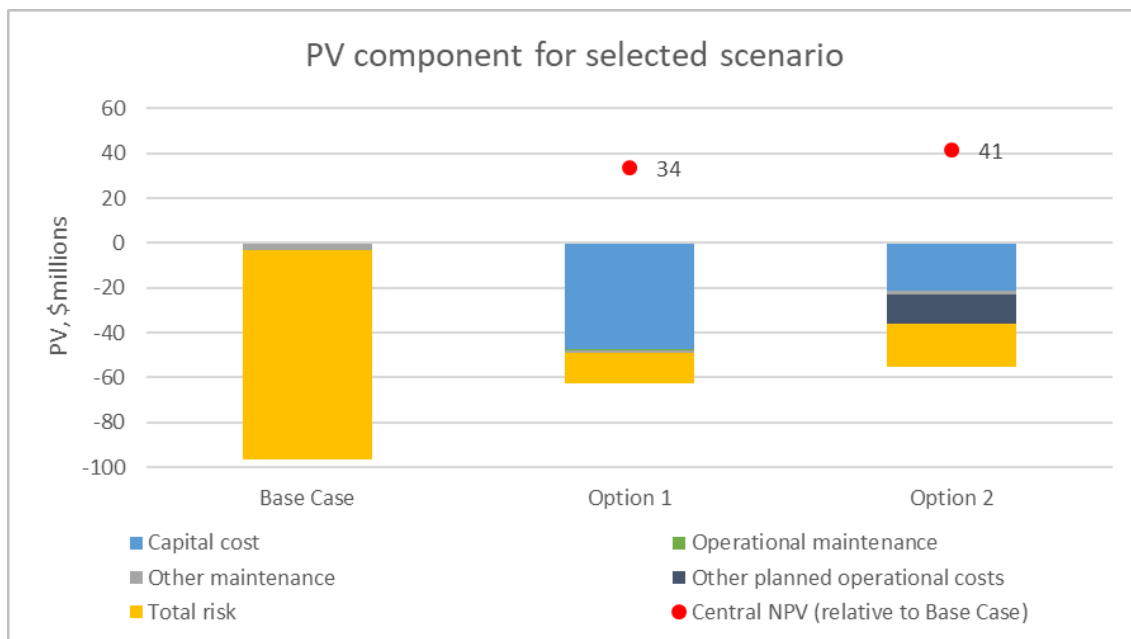
Option	Description	Indicative capital cost (\$m, 20/21)	Indicative annual O&M costs (\$m, 20/21)	Rank
Maintain existing network topology				
Option 1 Replace all at-risk assets like-for-like by June 2025	Replace selected primary plant and all secondary systems at Chinchilla by June 2025*	13.38		
	Replace four transformers and selected primary plant at Tarong by June 2025*	29.50	0.14	2
	Refit Tarong to Chinchilla transmission line by 2035 [†]	49.44		
Reconfigure network topology				
Option 2 Reconfigure Chinchilla and replace selected assets by June 2025	Replace selected primary plant and secondary systems at Chinchilla by June 2025*	10.06		
	Replace two transformers and selected primary plant at Tarong by June 2025*	17.84		
	Decommission Chinchilla transformer bays at Tarong by 2026 [†]	3.76	0.16	1
	Mothball Tarong to Chinchilla transmission line by 2026 [†]	3.00		
	Decommission the Tarong to Chinchilla transmission line by 2040 [†]	23.43		

* Proposed RIT-T capital project

[†] Modelled capital and operational projects

Figure 1 illustrates the results of the economic assessment, comparing both options to the non-credible Base Case.

Figure 1: Present value 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.

The economic analysis demonstrates that both credible options significantly reduce risk cost relative to the Base Case and result in positive NPV relative to Base Case. Option 1 provides the greatest reduction in risk costs, but at higher capital cost, while Option 2 provides the highest net economic return relative to the Base Case of the two credible options. Option 2 is therefore the preferred option.

Option 2 involves reconfiguring Chinchilla Substation such that supply is from the Surat Basin network, by replacing selected primary plant and secondary systems, and replacing only two of the four transformers at Tarong. The Chinchilla to Tarong transmission line will be mothballed under this option. The indicative capital cost of the RIT-T project for the preferred option is \$27.9 million in 2020/21 prices.

Option 2 delivers additional benefit in that it provides for the potential connection of renewable generation in the area by enabling the re-use of a section of the existing easement between Tarong and Chinchilla for the construction of a 275kV line from Halys Substation.

Under this option design work will commence in 2023, with all work completed by 2025.

Powerlink welcomes the potential for non-network options to form part or all of the solution

Powerlink welcomes submissions from proponents who consider that they could offer a credible non-network option that is both economically and technically feasible by June 2025, on an ongoing basis.

To replace the functionality of both of the existing (275k/66kV) transformers a non-network solution would be required to provide up to 50MW and up to 850MWh per day on an ongoing basis to meet the requirements of Powerlink’s planning criteria. The non-network solution must also be able to provide auxiliary supply to Tarong Power Station, of up to 38MVA.

[Lodging a submission with Powerlink](#)

Powerlink is seeking written submissions on this *Project Specification Consultation Report* by Monday, 22 November 2021, particularly on the credible options presented. Please address submissions to:

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