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Summary: Managing risk on Line 963

RIT-T Project Specification Consultation Report

Issue date: 14 February 2024

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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for mitigating environmental, safety and financial (reactive maintenance) risks caused by the widespread condition issues on various line components of the 132 kV transmission line running between Tomago and Taree ('Line 963'). Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

Line 963 is a 132 kV transmission line between Tomago and Taree that was commissioned in 1992. Transgrid owns the line north of the Karuah River (Structure 185 onwards) to Taree, while Ausgrid owns the line to the south (including the river crossing) to Tomago.

The line comprises 334 structures with each structure containing multiple wood poles; typically two or three wood poles per structure. This RIT-T will address condition issues affecting the structures, including non-pole relates issues such as insulators, fittings and signage.

Line 963 was impacted by the Hillville Fire in November 2019. The fire impacted a total of 42 Transgrid structures between Structures 435 and 475 (35 of them wood pole structures) over a route length of 13.7km. The line was restored to a serviceable condition following the fires to meet network needs in the mid-north coast of NSW.

Subsequent inspections of the sections impacted by the fire have identified eight structures as burnt and charred (Structures 445, 446, 449, 451, 452, 457, 460, 462). In addition, the conductor (particularly in the vicinity of Structure 446) has also had significant heat stress during the bushfire event, which can cause aluminium to anneal and lose mechanical strength. Further, the heat caused the conductor to lose some of its grease, which is expected to result in subsequent corrosion issues if not addressed.

In addition to the wood poles that are burnt and charred, detailed analysis of asset condition information has identified that various other non-bushfire-related condition issues impact 102 of the 334 structures across multiple line components, including wood pole deterioration (from rot and termites), insulators and earthwire.

Identified need: managing risks on Line 963

If the condition issues on the line are not addressed in sufficient time, then the asset will operate with increasing risk of failure as it continues to deteriorate. The level of reactive corrective maintenance needed to keep the line operating within required standards may also increase, particularly when asset failures ultimately occur.

Specifically, under the 'do nothing' base case, incidents such as conductor drop and tower collapse could occur. Such incidents could have considerable environmental risks through potential bushfires and could have considerable safety consequences for nearby residents and members of the public, as well as our field crew who may be working on or near the assets. These incidents also have financial risks associated with reactive maintenance that may be required under emergency conditions.

The proposed investment will enable us to manage environmental, safety and financial risks on Line 963.

We manage and mitigate safety and environmental risk to ensure they are below risk tolerance levels or 'As Low As Reasonably Practicable' ('ALARP'), in accordance with our obligations under the *New South*

Wales Electricity Supply (Safety and Network Management) Regulation 2014 and our Electricity Network Safety Management System (ENSMS).[1]

The proposed investment will enable us to continue to manage and operate this part of the network to a safety and risk mitigation level of ALARP, consistent with our obligations. Consequently, we consider it to be a reliability corrective action under the RIT-T. A reliability corrective action differs from a 'market benefits'-driven RIT-T in that the preferred option is permitted to have negative net economic benefits on account of it being required to meet an externally imposed obligation on the network business.

Two credible options have been considered

We consider that there are two feasible options from a technical, commercial and project delivery perspective that can be implemented in sufficient time to meet the identified need. Specifically:

- Option 1 involves replacement of all wood pole structures that have identified deterioration with steel or concrete poles, including the bushfire impacted wood poles. Option 1 would address all the identified condition issues on the line with the exception of the bushfire impacted conductor and earthwire.
- Option 2 is the same as Option 1, except that it also replaces the bushfire impacted conductor and 28km of earthwire.

The capital expenditure (capex) of these options is summarised in Table E-1 below.

Table E.1: Summary of the capex for the credible options

Option	Description of works	Capital expenditure ($2023/24)
Option 1	Replace 16 wood pole structures	$7.8m
Option 2	Replace 16 wood pole structures, the conductor between Structure 442 to 463 and 28km of earthwire	$9.0m

Neither option will affect annual routine operating costs since they do not affect the frequency of inspections.

There is no expectation of needing to uprate the line at this point in time

The proposed replacement works under Option 1 is focused on condition-based, like-for-like replacement. We do not expect the conductors included in this RIT-T need to be uprated at this point in time as we do not expect the line loadings to exceed their existing line ratings in the near future.

Line 963, along with lines 96P, 96F and 9C8, are the main transmission lines connecting the load in North-East Coast region to the generation in Hunter and central coast region. The line utilisation data in our 2023 Transmission Annual Planning Report shows Line 963 (132 kV) has a maximum utilisation rate of 87% under credible contingency.[2]

Specifically, we consider that uprating would cost significantly more than Option 1 and not add a commensurate increase in estimated market benefit. Uprating is therefore not considered commercially feasible at this point in time.

[1] Our ENSMS follows the International Organization for Standardization's ISO31000 risk management framework which requires following a hierarchy of hazard mitigation approach.
[2] Transgrid, *Transmission Annual Planning Report 2023*, p.155

Non-network options are not expected to be able to assist with this RIT-T

We do not consider non-network options to be commercially or technically feasible to assist with meeting the identified need for this RIT-T, as non-network options will not mitigate the environmental, safety and financial risks posed as a result of asset deterioration.

The options have been assessed against three reasonable scenarios

The credible options have been assessed under three scenarios as part of this PSCR assessment, which differ in terms of the key drivers of the estimated net market benefits (ie, the estimated risk costs avoided).

Given that wholesale market benefits are not relevant for this RIT-T, the three scenarios assume the expected most likely scenario for the Draft 2024 ISP (ie, the 'Step Change' scenario). The scenarios differ by the assumed level of risk costs, given that these are key parameters that may affect the ranking of the credible options. Risk cost assumptions do not form part of AEMO's ISP assumptions and have therefore been based on Transgrid's analysis.

Table E.2: Summary of scenarios

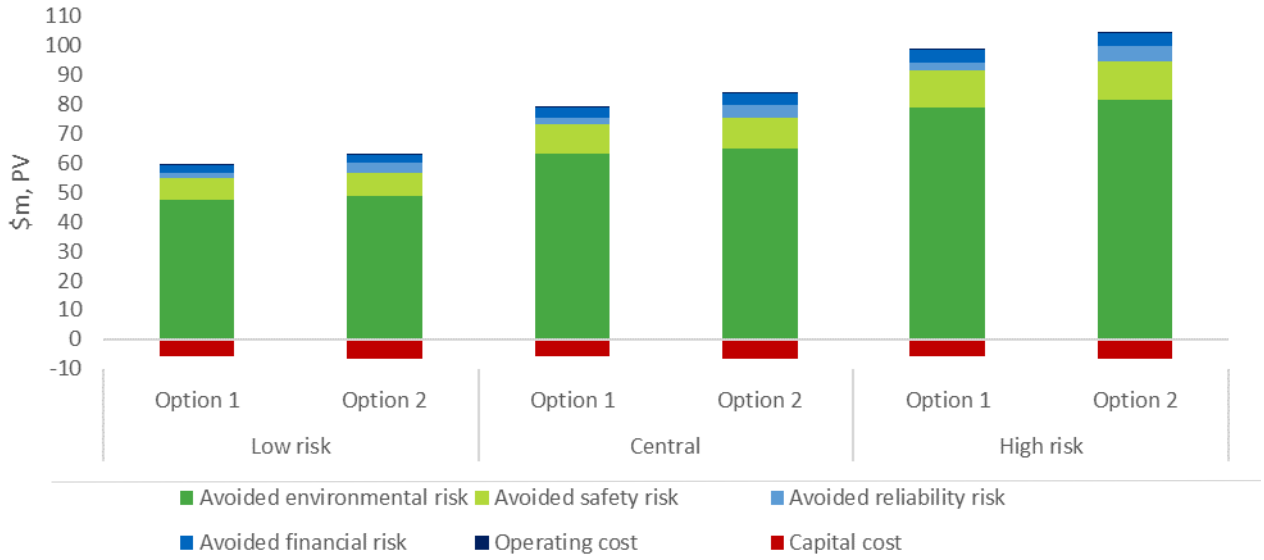
Variable / Scenario	Central	Low risk cost scenario	High risk cost scenario
Scenario weighting	*1/3*	*1/3*	*1/3*
Discount rate	7.0%	7.0%	7.0%
Network capital costs	Base estimate	Base estimate	Base estimate
Operating and maintenance costs	Base estimate	Base estimate	Base estimate
Safety, environmental, and financial risk benefit	Base estimate	Base estimate – 25%	Base estimate +25%

We have weighted the three scenarios equally given there is nothing to suggest an alternate weighting would be more appropriate.

Option 2 delivers the greatest estimated net benefits

While the costs under both options are found to be significantly outweighed by the expected benefit of avoiding the risks in each scenario investigated, Option 2 is found to deliver the greatest estimated net benefits overall. On a weighted basis across all scenarios, Option 2 is found to deliver the greatest net economic benefits at approximately $76.8 million.

Figure E.1: Net economic benefits ($m, PV)



Draft conclusion

This PSCR has found that Option 2 is the preferred option at this draft stage of the RIT-T. Option 2 involves the remediation of all identified condition issues on the line structures, as well as the replacement of the conductor between Structure 442 to 463 with an equivalent conductor (and replacement of all conductor components and hardware.) The total number of structures expected to be replaced is 16 wood pole structures, 6km of conductor and 28km of earthwire.

Our analysis demonstrates that moving forward with this option is the most prudent and economically efficient solution to manage and mitigate safety and bushfire risk to ALARP. Consequently, it will ensure our obligations under the *New South Wales Electricity Supply (Safety and Network Management) Regulation 2014* and our ENSMS are met.

The estimated capital expenditure associated with Option 2 is $9.0 million (in 2023/24 dollars). The works are estimated to take place between 2023/24 and 2025/26.

Exemption from preparing a PADR

NER clause 5.16.4(z1) provides for a TNSP to be exempt from producing a PADR for a particular RIT-T application, in the following circumstances:

- if the estimated capital cost of the preferred option is less than $46 million;
- if the TNSP identifies in its PSCR its proposed preferred option, together with its reasons for the preferred option and notes that the proposed investment has the benefit of the clause 5.16.4(z1) exemption; and
- if the TNSP considers that the proposed preferred option and any other credible options in respect of the identified need will not have a material market benefit for the classes of market benefit specified in clause 5.16.1(c)(4), with the exception of market benefits arising from changes in voluntary and involuntary load shedding.

We consider that the investment in relation to Option 2 and the analysis presented in this PSCR meets these criteria and therefore that we are exempt from producing a PADR under NER clause 5.16.4(z1).

In accordance with NER clause 5.16.4(z1)(4), the exemption from producing a PADR will no longer apply if we consider that an additional credible option that could deliver a material market benefit is identified during the consultation period.

Accordingly, if we consider that any such additional credible options are identified, we will produce a PADR which includes an NPV assessment of the net market benefit of each additional credible option.

Should we consider that no additional credible options were identified during the consultation period that could have material market benefits, we intend to produce a PACR that addresses all submissions received, including any issues in relation to the proposed preferred option raised during the consultation period, and presents our conclusion on the preferred option for this RIT-T.

Submissions and next steps

We welcome written submissions on materials contained in this PSCR. Submissions are due on 14 May 2024.

Submissions should be emailed to our Regulation team via regulatory.consultation@transgrid.com.au.[3] In the subject field, please reference 'Line 963 PSCR'.

At the conclusion of the consultation process, all submissions received will be published on our website. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement.

Subject to additional credible options being identified, we anticipate publication of a PACR in June 2024.

[3] We are bound by the *Privacy Act 1988 (Cth)*. In making submissions in response to this consultation process, we will collect and hold your personal information such as your name, email address, employer and phone number for the purpose of receiving and following up on your submissions. If you do not wish for your submission to be made public, please clearly specify this at the time of lodgement. See Privacy Notice within the Disclaimer for more details.