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Summary: Managing risk on Line 23

RIT-T Project Specification Consultation Report

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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for mitigating safety, environmental (bushfire) and financial (high reactive maintenance) risks caused by the deteriorating condition of certain components of the 330 kV line running between the Vales Point and Munmorah substations on the Central Coast ('Line 23'). Publication of this Project Specification Consultation Report (PSCR) represents the first step in the RIT-T process.

Line 23 is a single-circuit 330 kV, steel tower transmission line with a route length of 7 km that was constructed in 1965. Line 23 is comprised of 24 structures:

- 12 suspension towers;
- 11 tension towers; and
- 1 wood pole suspension structure.

The line is a key link in the Central Coast transmission network and its route traverses rural areas near the Vales Point and Colongra power stations near Lake Macquarie.

As part of our ongoing routine asset monitoring maintenance, we have identified that many of the components of Line 23 are corroded and/or at the end of their lives, including conductor fittings, corona rings, earth wire (and its fittings) and porcelain insulators.

Corrosion greatly increases the likelihood of structure failure, which leads to conductor drops and presents consequent safety and bushfire risk to our personnel and the public, as well as resulting in reactive maintenance costs to repair the failed elements. While this is the case for any corroded elements of the transmission network, the bushfire risks are exacerbated for Line 23 as the line traverses substantial sections of bushland, much of which surrounds rural residential areas. Line 23 also crosses the Pacific Highway at Doyalson, which raises the safety risks.

As asset conditions deteriorate over time, the likelihood of failure and subsequent risks will increase should these issues not be addressed.

Identified need: managing risks on Line 23

If action is not taken, the condition of Line 23 is expected to expose us and our customers to increasing levels of risk going forward, as the likelihood of failure increases. There are significant safety and bushfire risks under the 'do nothing' base case, as well as higher expected costs associated with reactive maintenance that may be required under emergency conditions ('financial risks').

The proposed investment will enable us to manage safety, environmental and financial risks on Line 23.

Options considered under this RIT-T have been assessed relative to a base case. Under the base case, no proactive capital investment is made and the condition of the lines will continue to deteriorate.

Further condition deterioration of the affected assets due to corrosion would mean an increase in safety and bushfire risks as the likelihood of failure increases. If left untreated, corrosion of some of the vital components of the steel towers could result in incidents such as conductor drop and tower collapse. Such incidents could have serious 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 pose significant environmental risks through potential bushfires.

We manage and mitigate safety and bushfire 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 consistent with ALARP. Consequently, it is considered 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.

We note that the risk cost estimating methodology adopted for this RIT-T aligns with that used in our recently submitted Revised Revenue Proposal for the 2023-28 period. It reflects feedback from the Australian Energy Regulator (AER) on the methodology initially proposed in our original revenue proposal.

Credible options considered

In this PSCR, we have considered two credible options that would meet the identified need from a technical, commercial, and project delivery perspective.[2] These are summarised in Table E-1.1.

Table E-1.1 Summary of credible options

Option	Description	Capital costs, $m	Operating costs (per year), $
Option 1	Replace suspension structures that have priority condition issues and remediate all line components on tension structures	12.3	10,120
Option 2	Replace all suspension structures and remediate all line components on tension structures	13.4	10,120

Both options are not expected to affect annual routine operating costs (i.e., the amounts shown above are the same as under the base case) since they do not affect the frequency of inspections. They do however affect the reactive maintenance costs relative to the base case (which are reflected in reduced 'financial risk costs').

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 and technically feasible to assist with meeting the identified need for this RIT-T, as non-network options will not mitigate the safety and environment risk posed as a result of corrosion-related 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 implicitly assume the most likely scenario from the 2022 ISP (ie, the 'Step Change' scenario). The scenarios differ by the

[1] Our ENSMS follows the International Organization for Standardization's ISO31000 risk management framework which requires following a hierarchy of hazard mitigation approach.

[2] As per clause 5.15.2(a) of the NER.

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 been based on Transgrid's analysis.

Table E-1-2 Summary of scenarios

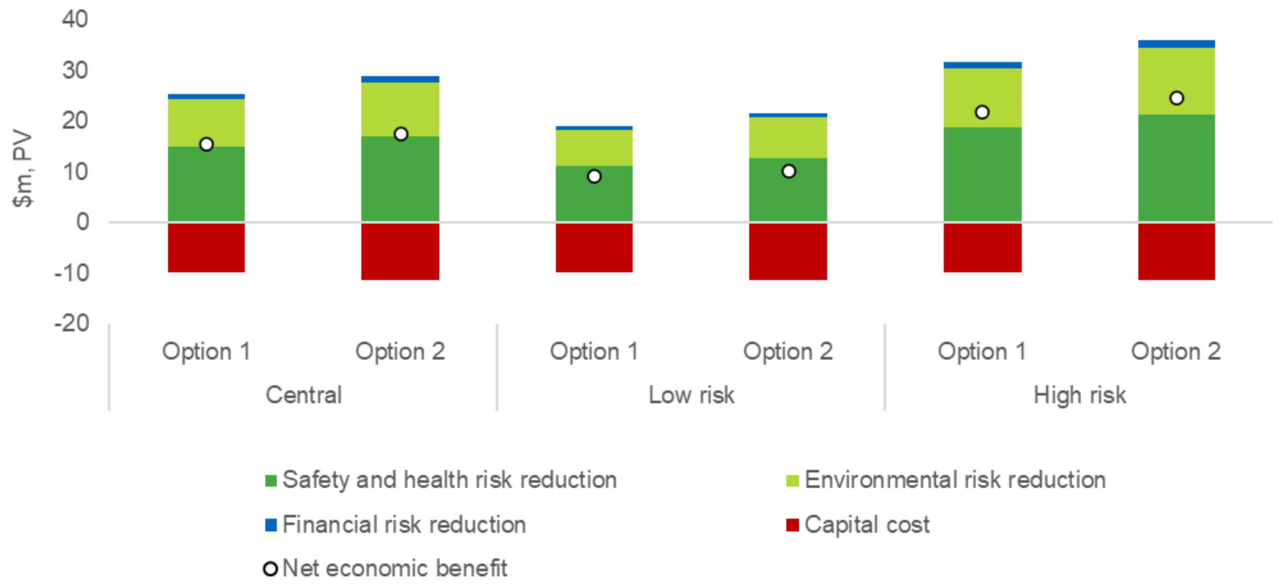
Variable / Scenario	Central	Low risk cost scenario	High risk cost scenario risk
Scenario weighting	*33%*	*33%*	*33%*
Discount rate	5.50%	5.50%	5.50%
Network capital costs	Base estimate	Base estimate	Base estimate
Operating and maintenance costs	Base estimate	Base estimate	Base estimate
Safety, environmental and financial risk benefit	Base estimate	Base estimate – 25%	Base estimate +25%

How the NPV results are affected by changes to other variables (including the discount rate and capital costs) has been investigated in sensitivity analysis.

Option 2 delivers the greatest net economic benefits

Under all scenarios, the costs of mitigating the risks under both options are found to be significantly outweighed by the expected benefit of avoiding the risks. Option 2 provides the greatest estimated net benefit of the two options considered – with net benefits that are approximately 12 per cent greater than Option 1.

Figure E-1.1 Net economic benefits ($m, PV)



Draft conclusion

Option 2 (replacing all suspension structures and remediating all line components on tension structures) is the preferred option to meet the identified need at this stage of the RIT-T. Moving forward with this option is the most prudent and economically efficient solution to manage and mitigate safety and environmental risk to ALARP. Consequently, it will ensure our obligations under the *New South Wales Electricity Supply (Safety and Network Management) Regulation 2014* and our Electricity Network Safety Management System (ENSMS) are met.

The estimated capital expenditure associated with this option is $13.4 million. Routine operating and maintenance costs relating to planned checks by our field crew are approximately $10,120 per year (which is the same as under the base case and the other option considered). We calculate that the avoided risk cost by undertaking Option 2 ranges from approximately $1.2 million per year to $6.5 million per year in real terms over the assessment period.

Option 2 is found to have positive net benefits under all scenarios investigated and, on a weighted basis, will deliver $17.4 million in net economic benefits.

The works would be undertaken between 2022/23 and 2024/25. All works would be completed in accordance with the relevant standards by 2025/26 with minimal modification to the wider transmission assets. Necessary outages of affected line(s) in service would be planned appropriately in order to complete the works with minimal impact on the network.

Exemption from preparing a PADR

NER clause 5.16.4(z1) provides for a TNSP to be exempt from producing a Project Assessment Draft Report (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 the investment in relation to Option 2 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 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, 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

The purpose of this PSCR is to set out the reasons we propose that action be taken, present the options that address the identified need, outline the technical characteristics that non-network options will need to provide, and allow interested parties to make submissions and provide input to the RIT-T assessment.

We welcome written submissions on materials contained in this PSCR. Submissions are due on 15 June 2023[3].

Submissions should be emailed to our Regulation team via regulatory.consultation@transgrid.com.au.[4] In the subject field, please reference 'Line 23 Transmission Lines 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 during consultation, we anticipate publication of a PACR in July 2023.

[3] Consultation period is for 12 weeks, additional days have been added to cover public holidays.

[4] 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.