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Summary: Managing risk on Line 11 (Dapto-Sydney South)

RIT-T Project Specification Consultation Report

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Region: Greater Sydney and Southern NSW

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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 a single circuit transmission line in the Great Sydney and Southern NSW regions.

Line 11 is a single circuit steel tower 330 kV transmission line between Dapto and Sydney South substations, with a route length of 68km. There are 154 structures on this single circuit line including 129 suspension towers and 25 tension towers. The line is a key link in the Sydney South coastal region, and its route traverses urban areas near the substations, bushland in the Illawarra Escarpment, Sydney Water Catchment and National Park areas and also crosses the Princes Motorway (M1) at several locations.

Line 11 is considered to have the highest level of corrosion among Transgrid's transmission lines and has a history of corrosion related defects affecting tower members, conductor/earthwire fittings, insulators and fasteners (nuts and bolts). A refurbishment project was completed in early 2018 on tension towers in line with the strategy to refurbish tension towers prior to steel loss and end of life and replace suspension structures at end of life. This need focuses on the suspension structures which are at the end of life.

This need focuses on the suspension structures, which are in varying condition along the line. Many of these are reaching end of life, while others show signs of deterioration, but where refurbishment is an option to achieve another 20 plus years of service. This Need includes replacement of 127 spans of conductor which has suffered deterioration due to bushfires, as well as replacement of insulators where new structures or new conductor is installed, and where new insulators are required due to Transgrid condition and type requirements (i.e. where the installed insulator types have demonstrated poor reliability due to poor quality or manufacturing defects).

Detailed analysis of asset condition information indicates that almost all suspension structures and/or other components on Line 11 have condition issues of some form (structure and conductor) including grillage deterioration which increase the probability of asset failure. This presents a bushfire and safety risk which Transgrid is obligated to manage.

The main drivers of the need to remediate these issues are:

- Manage network safety risk levels "As-Low-As Reasonably Practicable" in accordance with the regulation obligations and Transgrid's business risk appetite. Under the Electricity Supply (Safety and Network Management) Regulation 2014 Section 5 'A network operator must take all reasonable steps to ensure that the design, construction, commissioning, operation and decommissioning of its network (or any part of its network) is safe'; and
- Provide economic benefit to consumers through reduction in reliability, safety and bushfire risks.

Identified need: managing risks on Line 11

If action is not taken, the condition of the lines is expected to expose us and our customers to increasing levels of risk going forward, as the likelihood of failure increases. There are 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 these risks on Line 11.

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 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.

We manage and mitigate bushfire and safety 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. 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 Revised Revenue Proposal for the 2023-28 period. It reflects feedback from the Australian Energy Regulator (AER) on the methodology proposed in our initial Revenue Proposal.

Credible options considered

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.

Table E-1 Summary of credible options

Option	Description	Capital costs ($m, +/- 25%, Real 2024/25)
Option 1	Replace 43 suspension structures and refurbish 55 suspension structures. Assessment and refurbishment of grillage foundations as required and installation of new conductor on 127 spans. Replacement of insulators.	39.95
Option 2	Replace 98 suspension structures and refurbish 1 suspension structures with bent members. Assessment and refurbishment of grillage foundations as required Installation of new conductor on 127 spans. Replacement of Insulators.	69.32

The preferred option is Option 1, as it has the highest weighted NPV result of the technically and commercially feasible options considered at this stage of the RIT-T process. In consideration of the delivery requirements and the economic benefit NPV analysis for the need, its optimal timing is 2028/29.

[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.

Non-network options are not expected to assist in 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 (bushfire) risk posed as a result of corrosion-related asset deterioration.

The options have been assessed against three reasonable scenarios

The RIT-T is focused on identifying the top ranked credible option in terms of expected net benefits. However, uncertainty exists in terms of estimating future inputs and variables (termed future 'states of the world').

To deal with this uncertainty, the NER requires that costs and market benefits for each credible option are estimated under reasonable scenarios and then weighted based on the likelihood of each scenario to determine a weighted ('expected') net benefit. It is this 'expected' net benefit that is used to rank credible options and identify the preferred option.

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 (i.e., 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 2024 ISP (i.e., the 'Step Change' scenario). The scenarios differ by the assumed level of risk costs and unserved energy, 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, as discussed in section 2.

We developed the Central Scenario around a static model of demand scenarios, described further in Section A.3 of our Network Asset Criticality Framework. We consider that this approach is appropriate since it materially reduces the computational effort required, and since differences in demand forecasts will not materially affect the ranking of the credible options.

How the NPV results are affected by changes to other variables (including the discount rate and capital costs) has been investigated in the sensitivity analysis. We consider this is consistent with the latest AER guidance for RIT-Ts of this type (i.e., where wholesale market benefits are not expected to be material).[3],[4],[5]

A summary of the key variables in each scenario is provided in the table below.

[3] AER, *Application Guidelines Regulatory Investment Test for Transmission*, November 2024, pp. 42-44.

[4] We consider the approach to scenarios and sensitivities to be consistent with the AER guidance provided in November 2022 in the context of the disputes of the North West Slopes and Bathurst, Orange and Parkes RIT-Ts. See: AER, *Decision: North West Slopes and Bathurst, Orange and Parkes Determination on dispute - Application of the regulatory investment test for transmission*, November 2022, pp. 18-20 & 31-32, as well as with the AER's RIT-T Guidelines.

[5] AEMO '2023 Inputs, Assumptions and Scenarios Report', July 2023, p 123-124

Table E-2 Summary of scenarios

Variable / Scenario	Central	Low risk cost scenario	High risk cost scenario risk
Scenario weighting	*1/3*	*1/3*	*1/3*
Discount rate	7%	7%	7%
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%

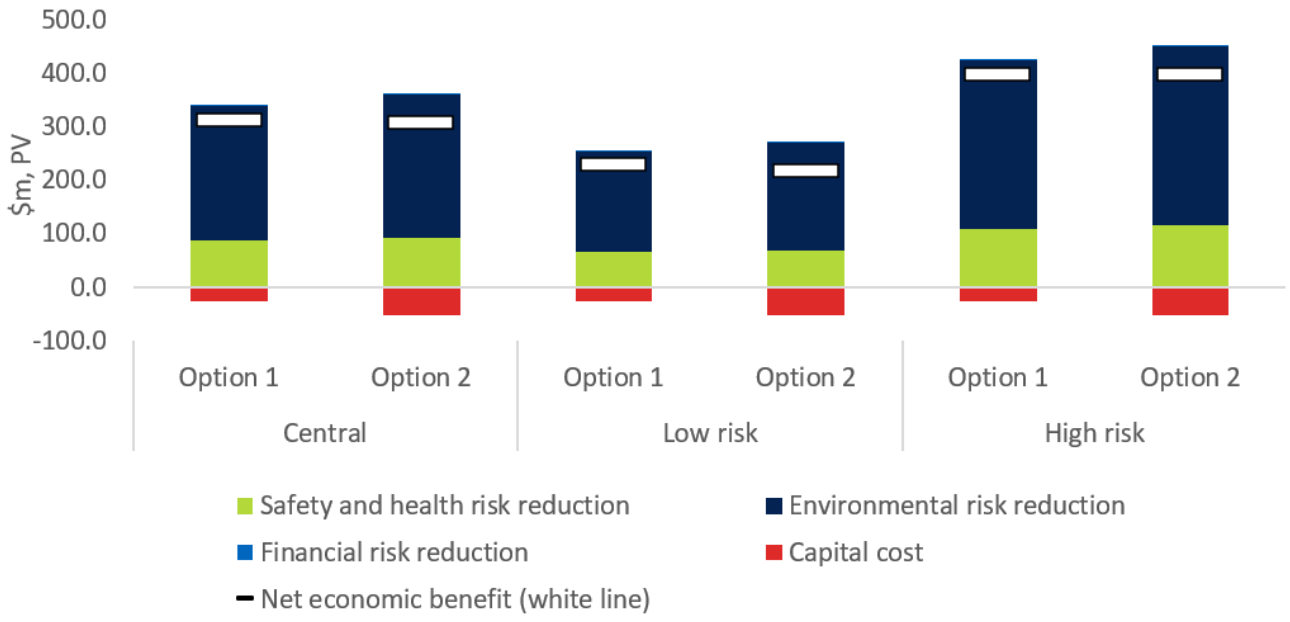
How the NPV results are affected by changes to other variables (including the discount rate and capital costs) has been investigated in sensitivity analysis.

Option 1 delivers the greatest net economic benefits

Under all scenarios, the costs of mitigating the risks under Option 1 are found to be significantly outweighed by the expected benefit of avoiding the risks. This is also true for Option 2, however to a lesser extent.

The net economic benefits delivered by Option 1 are estimated at $313.44 million.

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



Draft conclusion

Option 1 (Replace 43 suspension structures and refurbish 55 suspension structures. Assessment and refurbishment of grillage foundations as required and installation of new conductor on 127 spans. Replacement of insulators.) 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 $39.95 million. Routine operating and maintenance costs relating to planned checks by our field crew are $24,393 per year. We calculate that the avoided risk cost from undertaking Option 1 ranges from approximately $23.56 million per year to $80.29 million per year in real terms over the assessment period.

Option 1 is found to have positive net benefits under all scenarios investigated and, on a weighted basis, will deliver $313.44 million in net economic benefits over the assessment period.

The required works for Option 1, including preparation works, would be undertaken between 2024/25 and 2027/28. All works would be completed in accordance with the relevant standards 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

Subject to additional credible options being identified during the consultation period, publication of a Project Assessment Draft Report (PADR) is not required for this RIT-T as we consider its investment in relation to the preferred option to be exempt from that part of the process under NER clause 5.16.4(z1). Production of a PADR is not required due to:

- the estimated capital cost of the proposed preferred option being less than $54 million;
- the PSCR states:
  - the proposed preferred option, together with the reasons for the proposed preferred option;
  - the RIT-T is exempt from producing a PADR; and
  - the proposed preferred option and any other credible option will not have a material market benefit for the classes of market benefit specified in clause 5.16.4(z1)(4), with the exception of market benefits arising from changes in voluntary and involuntary load shedding;
- the RIT-T proponent considers that there were no PSCR submissions identifying additional credible options that could deliver a material market benefit; and
- the PACR must address any issues raised in relation to the proposed preferred option during the PSCR consultation.
- We consider the investment in relation to Option 1 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

We welcome written submissions on materials contained in this PSCR. Submissions are due on 15 July 2025[6].

Submissions should be emailed to our Regulation team via regulatory.consultation@Transgrid.com.au.[7] In the subject field, please reference 'Line 11 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 mid 2025.

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

[7] 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.