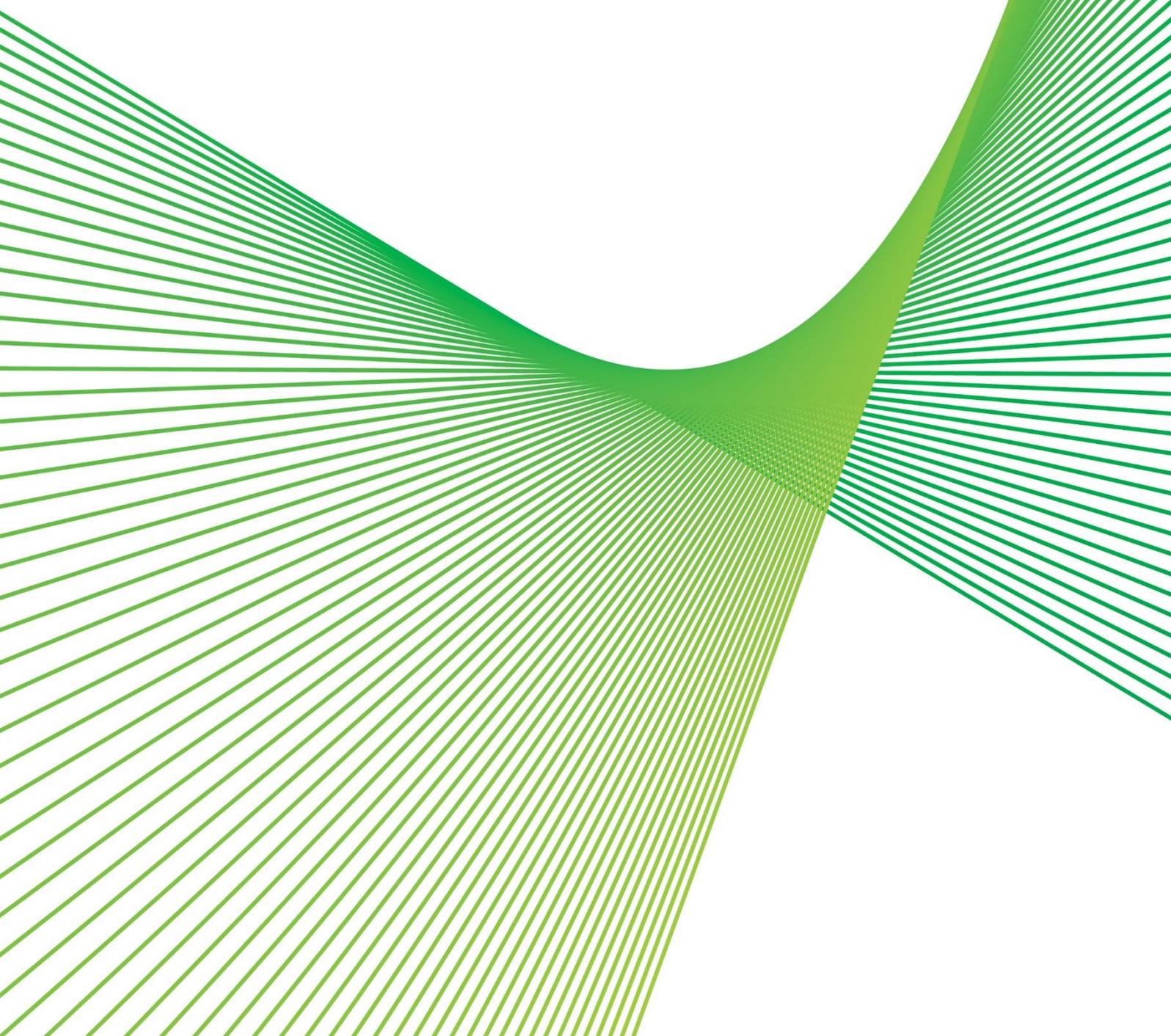


Summary: Managing risk on Line 977/1

RIT-T Project Assessment Conclusions 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 safety, environmental (bushfire) and financial (high reactive maintenance) risks caused by the deteriorating condition of certain components of the 132 kV line running between Canberra 330 kV and Queanbeyan 132 kV substations on the ACT and NSW network ('Line 977/1'). Publication of this Project Assessment Conclusions Report (PACR) represents the final step in the RIT-T process.

Commissioned in its current arrangement in 1969, Line 977/1 spans a route of 54km. The line is comprised of 282 structures: 278 single circuit wood pole structures between Structure 5 and Queanbeyan; and a short section where it runs as a double circuit with Line 976/1 outside Canberra substation between Structure 1 and Structure 4¹. Line 977/1 mainly traverses through agricultural land on the outskirts of Canberra in both the ACT and NSW.

A condition assessment performed through our routine maintenance program between 2017 and 2021 identified several condition issues on Line 977/1. Laboratory testing has also identified that some insulators have reached end of serviceable life due to deteriorated insulation resistance. A significant proportion of the wood pole structures are impacted by various levels of deterioration and corrosion. The affected components include wood poles, insulators, crossarms, conductor fittings, earthwire fittings and pole guys.

Wood pole deterioration increases the likelihood of structure failure, which leads to conductor drop 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 deteriorated elements of the transmission network, the bushfire risks are elevated for Line 977/1 as the line traverses sections of bushland, ACT Forestry, rural agricultural areas in the outer ACT and NSW surrounding areas.

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 977/1

If action is not taken, the condition of Line 977/1 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 safety, environmental, reliability and financial risks on Line 977/1.

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.

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).²

¹ Structure 1, Structure 4 and Structure 5 are located at the Canberra end of Line 977/1, just outside Canberra substation.

² Our ENSMS follows the International Organization for Standardization's ISO31000 risk management framework which requires following a hierarchy of hazard mitigation approach.

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.

No submissions received in response to the Project Specification Consultation Report

We published a Project Specification Consultation Report (PSCR) on 18 October 2023 and invited written submissions on the material presented within the document. No submissions were received in response to the PSCR.

No material developments since publication of the PSCR

No additional credible options were identified during the consultation period following publication of the PSCR. In addition, no material changes have occurred since the PSCR that have made an impact on the preferred option.

At the time the PSCR was published, the cost estimate for Option 1 was primarily based on a desktop assessment of the activity required to replace 36 wood pole structures known to be degraded and deteriorated transmission line components. Our latest assessments have shown the condition of an additional two structures will need to be addressed, based on the condition. At this stage of the RIT-T we expect the capital expenditure to remain within +/- 25% of the estimate presented in the PSCR (approximately \$12.1m in real \$2021-22).

No additional credible options have been identified and as there is currently only one credible option, therefore any cost variance due to the addition of two structures will not result in a material change in circumstances.

Option 1 remains the preferred option at this stage of the RIT-T.

We note that, since the PSCR was released, there has been a law change to introduce an emissions reduction objective into the national energy objectives³ and that the National Electricity Rules are currently being updated to add a new category of market benefit to the RIT-T reflecting changes in Australia's greenhouse gas emissions.⁴ While we acknowledge this important change to the RIT-T, we note that there is not expected to be a difference in greenhouse gas emission levels because there is no change in options by implementing the emission change into the NPV. Therefore, this new category of market benefit is therefore not expected to be material for this RIT-T and so has not been estimated.

³ On 12 August 2022, Energy Ministers agreed to fast track the introduction of an emissions reduction objective into the national energy objectives, consisting of the National Electricity Objective (NEO), National Gas Objective and National Energy Retail Objective. On 21 September 2023, the *Statutes Amendment (National Energy Laws) (Emissions Reductions Objectives) Act 2023* (the Act) received Royal Assent.

⁴ AEMC, *Harmonising the electricity network planning and investment rules and AER guidelines with the updated energy objectives (electricity)*, draft determination, 26 October 2023, p. i.

Credible options considered

In this PACR, we have considered one credible option that would meet the identified need from a technical, commercial, and project delivery perspective.⁵ This option is summarised in the table below.

Table E-1 Summary of credible options

Option	Description	Capital costs (\$m +/- 25%, Real \$2021-22)	Operating costs (per year), \$
Option 1	Replace wood pole structures that are known to be degraded and deteriorated transmission line components.	12.1	65,837

Option 1 is not expected to materially affect annual routine operating costs (i.e., the amounts shown above are only slightly less than 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').

Four other options were considered but not progressed including increased inspections, elimination of all associated risk, new transmission line and non-network solutions. The reasons these options were not progressed are outlined in Section 3.3 of this PACR.

Non-network options are not able to assist for 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 deteriorating wood pole, insulators and crossarm condition. In addition, we did not receive any submissions from proponents of any non-network solutions in response to the PSCR.

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 PACR 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 Draft 2024 ISP (ie, 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

⁵ As per clause 5.15.2(a) of the NER.

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).^{6, 7, 8}

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

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%

The sensitivity analysis has investigated how the NPV results are affected by changes to other variables, including the discount rate and capital costs.

Option 1 delivers positive net economic benefits

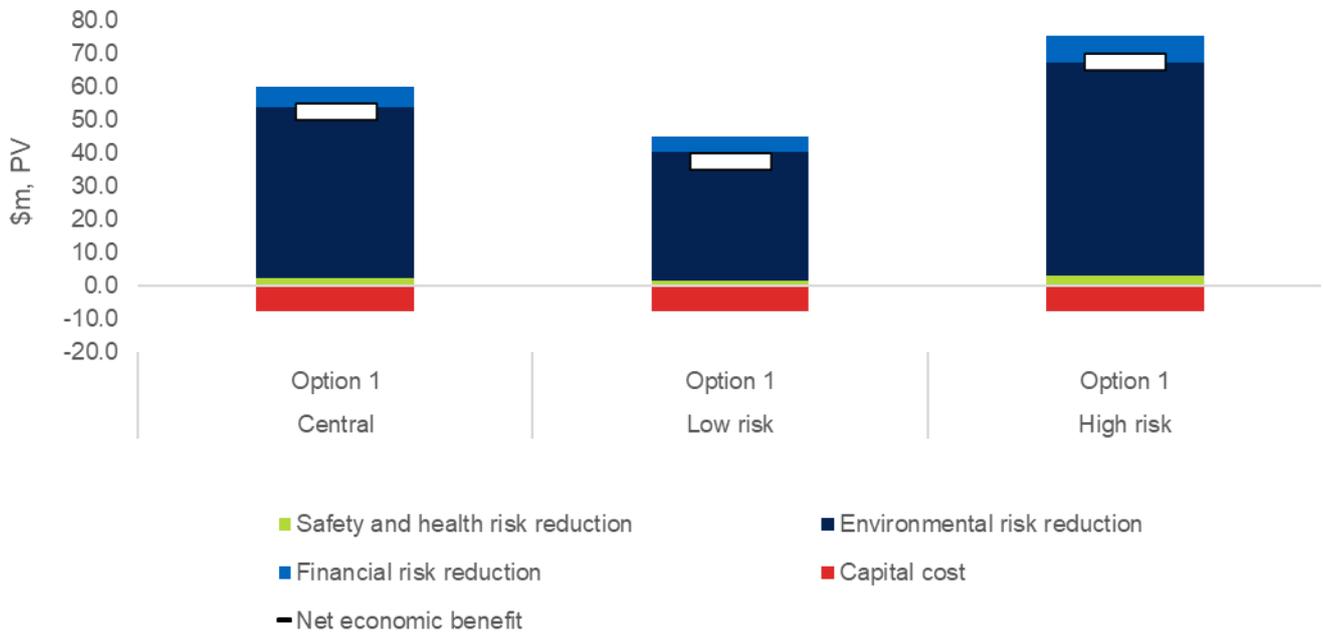
Under all scenarios, the costs of mitigating the risks under Option 1 are found to be significantly outweighed by the expected benefit of avoiding the risks. The net economic benefits delivered by Option 1 are estimated at \$52.6m.

⁶ AER, *Application Guidelines Regulatory Investment Test for Transmission*, August 2020, pp. 40-41.

⁷ 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.

⁸ AEMO '2023 Inputs, Assumptions and Scenarios Report', July 2023, p 123-124

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



Conclusion

Option 1 (remediating all identified condition issues on the line) 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 \$12.1 million. Routine operating and maintenance costs relating to planned checks by our field crew are approximately \$65,837 per year. We calculate that the avoided risk cost by undertaking Option 1 ranges from approximately \$2.9 million per year to \$27.8 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 \$52.6 million in net economic benefits.

The works would be undertaken between 2023/24 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.

Next steps

This PACR represents the final step of the consultation process in relation to the application of the RIT-T process undertaken by Transgrid.

The second step of the RIT-T process, production of a Project Assessment Draft Report (PADR), was not required as the investment meets the criteria for exemption under NER clause 5.16.4(z1), ie:

- the estimated capital cost of the preferred option is less than \$46 million;
- the PSCR included statements on:
 - the proposed preferred option, together with the reasons for the proposed preferred option;
 - that Transgrid expects to be exempt from producing a PADR; and
 - that the proposed preferred option and any other credible options will not have a material market benefit for the classes of market benefit specified in clause 5.15A.2(b)(4), with the exception of market benefits arising from changes in voluntary and involuntary load shedding;
- no PSCR submissions identified additional credible options that could deliver a material market benefit; and
- the PACR addresses any issues raised in relation to the proposed preferred option during the PSCR consultation (noting that no issues have been raised).

Parties wishing to raise a dispute notice with the AER may do so prior to 16 March 2024 (30 days after publication of this PACR). Any dispute notices raised during this period will be addressed by the AER within 40 to 120 days, after which the formal RIT-T process will conclude.

Further details on the RIT-T can be obtained from Transgrid's Regulation team via regulatory.consultation@transgrid.com.au. In the subject field, please reference 'Line 977-1 PACR'.