Transgrid

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Managing risk on Lines 21, 22, 959 & 92Z (conductor condition)

Notification of MCC Assessment

Location: Greater Sydney, Newcastle & Central Coast regions

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2. Executive Summary

On 3 July 2024 we completed the Regulatory Investment Test for Transmission (RIT-T) for managing risk on Lines 21, 22, 959 & 92Z (conductor condition). This RIT-T considered one credible option:

- Option 1 – replacement of existing conductors along Line 21,22, 959 & 92Z

The RIT-T identified Option 1 as the preferred option. Capital costs for Option 1 have increased since completion of the RIT-T.

We have performed a Material Change in Circumstance (MCC) Assessment to ascertain whether this increase constitutes a MCC as contemplated in the National Electricity Rules (NER)[1]. More specifically, this assessment examined whether the change in capital costs and timing resulted in a material change in circumstances, relating to the preferred option identified in the final RIT-T document, our Project Assessment Conclusions Report (PACR). In this MCC Assessment we refer to this as whether an 'MCC event' has occurred.

Section 3.2 of this MCC Assessment outlines the underlying factors affecting the cost. For Option 1, contract pricing was obtained through a market process, with received prices falling within +/- 10% of the central capital cost estimate (Class 3 estimate). Higher labour hire and material costs, route location complexity, multiple undercrossings involving external stakeholders, and tight outage constraints have all contributed to increased costs. In particular, outage limitations add significant complexity to the construction methodology.

Labour and material cost, together with strong industry demand for projects of this nature are now materially higher than those assumed in the PACR cost forecasts.

The Net Present Value (NPV) results (which determine which option is preferred) are presented below. Option 1 remains the preferred option, despite its NPV falling from $329.1 million in the PACR to $120.1 million in this MCC Assessment. Compared to the PACR, the net economic benefit has decreased due to higher costs (increased by 51%) and reduced benefits from avoided risk costs, both of which negatively affect the NPV.

Table 1 Original and revised NPV of economic benefits relative to the base case ($m, 2023/24)

Assessment	Option 1	Preferred Option
Original (as presented in the PACR)	329.5	Option 1
Revised (MCC Assessment)	120.1	Option 1

This MCC Assessment confirms that Option 1 remains the preferred option for managing risk on Lines 959, 92Z, 21 & 22 (conductor condition). We therefore have concluded that an MCC event has not occurred. This MCC Assessment includes a statement that the preferred option remains the preferred option and sets out supporting information necessary to demonstrate that the preferred option identified remains the preferred option in section 5 (MCC Assessment results).[2]

[1] As per clause 5.16.4(Z3)(3) of the NER
[2] As per clause 5.16.4(Z3) of the NER

3. Context and purpose of this report

On 3 July 2024 we completed the Regulatory Investment Test for Transmission (RIT-T) for managing risk on Lines 21, 22, 959 & 92Z (conductor condition). This RIT-T considered one credible option:

- Option 1 – Replacement of existing conductors along Line 21, 22, 959 & 92Z

This option involves targeted replacement of existing conductors along Line 21, 22, 959 & 92Z, which have been identified as priority lines based on expected NPV per kilometre and outage constraints. The cumulative length of all segments contained within this option is 51 km. The remediation includes replacement of all conductor compression fittings, suspension clamps/Armour Grip Suspension Units (AGSU), jumper connections, spacers and vibration dampers on relevant sections of lines.

3.1. Background to the RIT-T

Transgrid's overhead transmission network contains sections where the condition of conductors are deteriorating such that they have reached, or are close to reaching, end of life. The deteriorated condition of conductors can be caused by a variety of mechanisms such as:

- annealing due to bushfire exposure
- corrosion initiated by bushfire exposure, and
- corrosion at mid-span join locations

We undertook analysis of conductor condition and deterioration mechanisms across our network, and through this process identified approximately 1,100 km circuit length of conductors that have condition issues that require attention.

We also undertook analysis of bushfire impact history and mid-span joint locations, mapped against corrosion zones, and identified the locations that were likely exposed to degradation mechanisms described above. Various inspections have identified visual indicators of degradation such as broken strands, bulging, visible corrosion product, out of lay strands and discolouration.

Material testing of conductor samples from the locations identified through our analysis and inspections confirmed a range of conductor condition issues, including:

- aluminium and zinc oxides were contained within the white surface product, partial loss of the galvanising layer on the steel strands, and reduction in the cross section of inner aluminium strands;
- loss of tensile strength at the locations on the conductor where strands were out of lay; and
- migration of the conductor grease away from the inner layers of the conductor at locations where surface deposits and discolouration was observed.

Conductor degradation greatly increases the likelihood of conductor drops and consequently presents safety and bushfire risk to the public. If these condition issues are not addressed through the timely implementation of the preferred technically and commercially feasible remediation option, then the affected lines will operate with increasing probability of failure as it continues to deteriorate.

Transgrid has identified four lines with conductors that must be replaced:

- Line 21: Tuggerah 330 kV – Sydney North 330 kV;
- Line 22: Vales Point Power Station – Sydney North 330 kV;

- Line 959: Sydney North 330 kV – Sydney East 330 kV; and
- Line 92Z: Sydney North 330 kV – Sydney East 330 kV.

3.2. Capital cost changes since RIT-T completion

Table shows that the capital costs for Option 1 have changed since the PACR.

Table 2 Original and revised capital cost relative to the base case ($m, 2023/24)

Cost	Option 1
Original (as presented in the PACR)	36.6
Revised[3] (MCC Assessment)	55.2

For comparison purposes, the costs are presented in $2023/24, which is what was used in the PACR. The current costs in $2025/26[4] are $58.7m for Option 1.

- The underlying factors driving these cost changes include:

- Significant increase in supply chain costs not anticipated in the original estimate
- Routes have become more complex than initially anticipated:
  > Line 21 particularly had severely damaged tracks and numerous environmental constraints.
  > Multiple significant and complex undercrossing (rail corridors, Pacific Highway, M1 Motorway, Hawkesbury River and multiple distributor feeders) requiring detailed engineering reviews, safety verification and approvals and traffic management.
- Strict outage constraints:
  > Coordinating outages have been difficult for these lines as they are critical. Tight outage windows and short recall times have increased complexity in the construction methodology.
- Increased internal resource requirement to manage safety and interfaces
  > Standard labour assumptions were not sufficient as there is a number of concurrent interfaces and require more labour to manage risks and maintain safe delivery.
- Operating cost changes since RIT-T completion.

[3] Values deescalated from nominal and 2025/26 to 2023/24 values in accordance with ABS real CPI data and RBA latest forecast.
[4] Values de-escalated from nominal to 2025/26 values in accordance with RBA latest forecast.

There is no incremental increase in the operating costs since the PACR. Option 1 will not affect annual routine operating costs since it does not affect the frequency of inspection.

3.3. Material change in circumstance provisions in the NER

The NER covers the situation where there has been a material change in circumstance following the publication of a PACR. It is important to note that the increase in the capital cost estimate for the project, whilst substantial, does not in itself mean that an MCC event has occurred for the purposes of the NER. The NER refers to a material change in circumstance as including, but not being limited to, a change to:

- key inputs and assumptions;
- the identified need described in the PACR; or
- the credible options assessed in the PACR.

Pursuant to these NER provisions, Transgrid has undertaken this MCC Assessment to evaluate whether the change in the capital cost for both options represent an MCC event.

4. Approach to the MCC Assessment

This section outlines the inputs and assumptions used to complete the MCC Assessment with updated capital costs for Option 1:

4.1. Assessment against the base case

The costs and benefits of each option are compared against a 'do nothing' base case. Under the base case, no proactive capital investment is made to address the deterioration of conductors on Line 21, Line 22, Line 959 and Line 92Z. Assets are left in service until they fail and require replacement.

While the base case is not a situation we plan to counter, and this RIT-T has been initiated specifically to avoid it, the RIT-T assessment is required to use this base case as a common point of reference when estimating the net benefits of each credible option.

The regular maintenance regime will not be able to mitigate the risk of asset failure that will expose Transgrid and end-customers to approximately $ 23.7 million in safety, environmental, and financial risk costs by 2035, rising to $33.7 million by the end of assessment period in 2043/44 in real $2025/26[5]. The environmental and safety risk costs are mainly due to the consequences of a bushfire event resulting from conductor drop. Under the base case, all of these risks will continue to increase.

4.2. Assessment period and discount rate

This MCC Assessment makes use of a 20-year assessment period from 2024/25 to 2043/44. This period takes into account the size, complexity and expected asset life of the options.

Where the capital components of the credible options have asset lives extending beyond the end of the assessment period, the NPV modelling includes a terminal value to capture the remaining asset life. This ensures that the capital cost of long-lived options over the assessment period is appropriately captured, and that all options have their costs and benefits assessed over a consistent period, irrespective of option type, technology or asset life. The terminal values have been calculated based on the undepreciated value of capital costs at the end of the analysis period. As a conservative assumption, we have effectively assumed that there are no additional cost and benefits after the analysis and period.

A real, pre-tax discount rate of 7 per cent has been adopted as the central assumption for the NPV analysis. We have additionally tested the sensitivity of the NPV results to a lower bound discount rate of 3 per cent and an upper bound discount rate of 10.0 per cent[6].

4.3. Approach to estimating option costs

We have estimated the capital and operating costs of the options based on the scope of works necessary together with costing experience from previous projects of a similar nature.

Option 1 includes cost estimates for Line 21, Line 22, 959 & 92Z. For Line 21, 22 and 959, we have received contract pricing after going out to the market and the pricing received is within +/- 10% of the

[5] This determination of yearly risk costs is based on our network asset risk assessment methodology and incorporates variables such as likelihood of failure/exposure, various types of consequence costs and corresponding likelihood of occurrence.

[6] AEMO *'2025 Inputs, Assumptions and Scenarios Report'*, August 2025, pp 159.

central capital cost estimate. For Line 22, we have updated the estimate to be in line with current market pricing for analysis purposes, though contractor pricing has not specifically been requested for Line 22.

An accuracy of +/- 10 per cent for cost estimates is consistent with industry best practice and aligns with the accuracy range of a 'Class 3 estimate', as defined in the Association for the Cost Engineering classification system. This approach has been taken due to Option 1 being identified as the preferred option in the RIT-T. All cost estimates are prepared in real, 2025/26 dollars. The cost estimates do not include or forecast any real cost escalation for materials.

There is no change to the operating costs presented in the PACR.

4.4. The option has been assessed against three reasonable scenarios

The credible option has been assessed under these three scenarios as part of this MCC assessment, which differs in terms of the key drivers of the estimated net market benefits (ie, the estimated risk costs avoided).

Given the wholesale market benefits are not relevant for this RIT-T, the three scenarios assume the expected most likely scenarios for the 2024 ISP (is, the 'Step Change' scenario). The scenarios differ by the assumed level of risk costs. Risk cost assumptions do not form part of AEMO's ISP assumptions and have been based on Transgrid's analysis.

Table 3 Summary of scenarios

Variable/Scenario	Central scenario	Low demand scenario	High demand scenario
Scenario weighting	*1/3*	*1/3*	*1/3*
Discount rate	7.00%	7.00%	7.00%
Network capital 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 alternative weighting would be more appropriate.

4.5. Sensitivity analysis

In addition to the scenario analysis, we have considered the robustness of the MCC Assessment outcome through undertaking various sensitivity testing.

The range of factors tested as part of the sensitivity analysis in this PACR are:

- lower and higher assumed capital costs;
- lower and higher estimated safety, environmental, and financial risk benefits; and
- alternate commercial discount rate assumptions.

In addition, we have also sought to identify the 'boundary value' for key variables beyond which the outcome of the analysis would change, including the amount by which capital costs would need to increase for the preferred option to no longer be preferred.

5. MCC assessment results

5.1. Original NPV results from the PACR

Original results presented within the PACR are shown in Table 1 below.

Table 1 Initial NPV of economic benefits relative to the base case ($m, 2023/24), as presented in the PACR

Option	Weighted scenario
Option 1	329.5

5.2. NPV results from this MCC Assessment

NPV results from this MCC Assessment are shown in Table 2 below.

Table 2 NPV of economic benefits relative to the base case ($m, 2023/24), as presented in this MCC Assessment.

Option	Weighted scenario
Option 1	120.1

6. Conclusion and recommendation

This MCC Assessment has found that Option 1 (replacement of exiting conductors along Line 21,22, 959 & 92Z) remains the preferred option, despite its NPV falling from $329.5 million in the PACR to $120.1 million (real $2023/24) in this MCC Assessment. As a result, an MCC event has not occurred.

Therefore, it is recommended that Transgrid continue to deliver the project using Option 1, replacement of exiting conductors along Line 21,22, 959 & 92Z.