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Summary: Managing increased fault levels in southern New South Wales

RIT-T Project Assessment Conclusions Report

Region: Southern New South Wales

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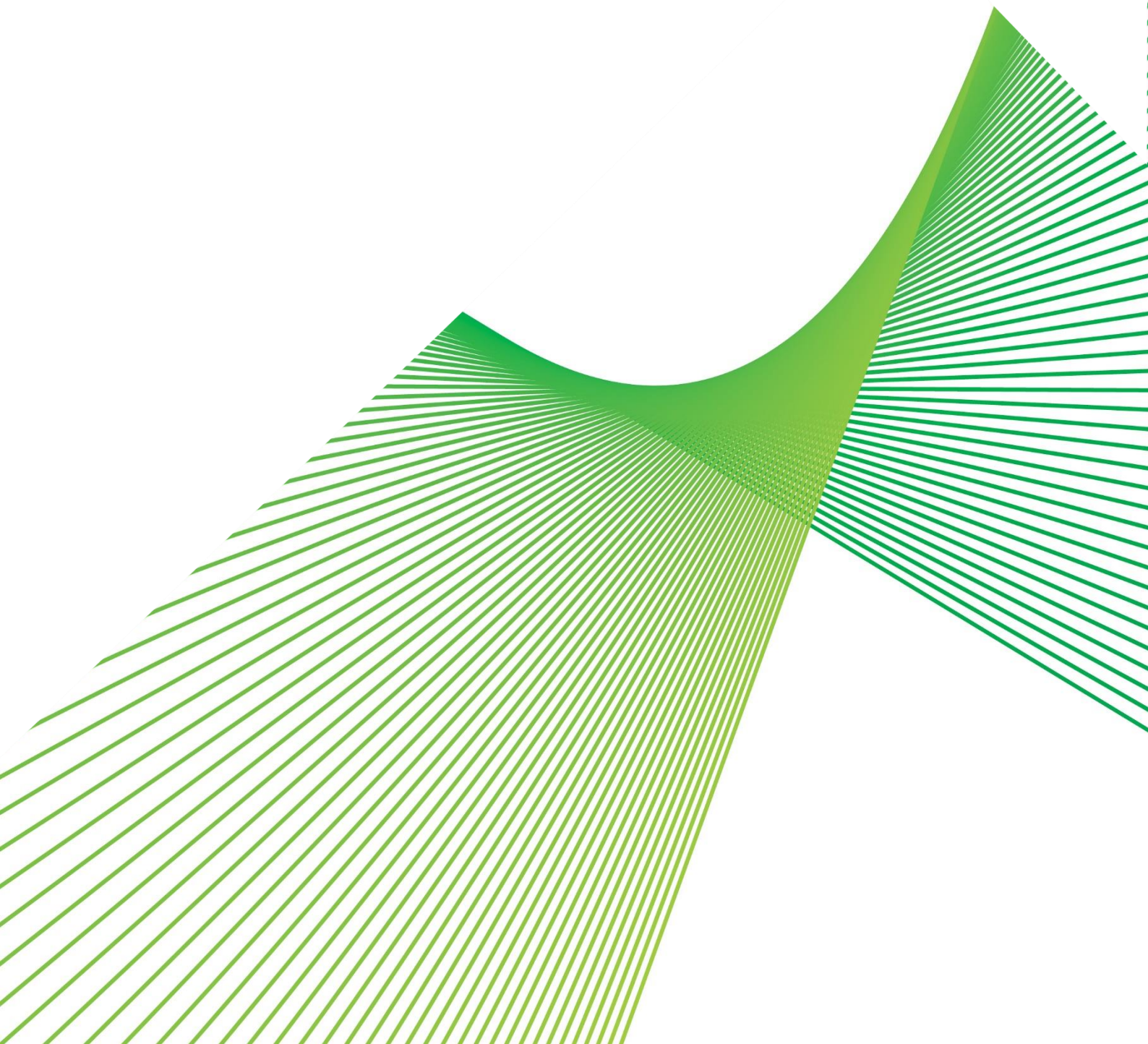

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Summary

We are applying the Regulatory Investment Test for Transmission (RIT-T) to options for ensuring increased fault levels in southern New South Wales (NSW) are managed appropriately and in the most efficient manner. This Project Assessment Conclusions Report (PACR) is the final step in the application of the RIT-T and follows the Project Assessment Draft Report (PADR) published on 19 December 2024.

The expected commissioning of three actionable ISP projects in southern NSW in coming years (Project EnergyConnect, HumeLink and VNI West), as well as full commercial operation of Snowy 2.0 in December 2028,[1] is expected to result in fault levels that exceed the existing fault level ratings of existing transmission assets at four of our substations in southern NSW if action is not taken. Without action, (i.e., under the base case), this would cause equipment failure and likely significant unserved energy to end consumers in the National Electricity Market (NEM).

The four affected substations are:

- Lower Tumut 330 kV substation;
- Upper Tumut 330 kV substation;
- Murray 330 kV substation; and
- Wagga 330 kV substation.

We are therefore undertaking this RIT-T to assess the options available for managing the expected increased fault levels at these substations, to avoid these consequences and to continue to maintain compliance with the relevant equipment standards under the National Electricity Rules (NER).

The scope of work covered by this RIT-T is necessarily separate to that included as part of the three actionable ISP projects mentioned above. Specifically, the assessment of fault level impacts involves complex network-wide considerations, and these impacts can only be accurately calculated after the design parameters and equipment specifications of the ISP projects have been fully identified (i.e., after the RIT-Ts for those projects have been completed). Further, due to the interconnected nature of the transmission network and the combined effects of multiple major projects, it would be very difficult to attribute the costs to any single project at the time of their respective RIT-Ts.

The separate nature of the scope of works covered by this RIT-T is consistent with the AER approving the 'managing increased fault levels in southern NSW' contingent project with a value of $54.3 million (in 2021/22 dollars) in its determination for our current regulatory control period.[2]

The AER accepting that we have completed a RIT-T to address this identified need is one of the four triggers for this contingent project. A further trigger is that Transgrid has a connection agreement in place with Snowy 2.0. We note that we will not formally commence the investment identified in this RIT-T unless the associated revenue is approved by the AER and will not proceed until the connection agreement is in place. We intend

[1] Snowy Hydro, *Securing the Future of Critical Energy Transformation Projects*, 31 August 2023, available at: https://www.snowyhydro.com.au/news/securing-the-future-of-critical-energy-transformation-resets/. We note that this timing is consistent with the latest (January 2025) AEMO generator information as at the time of finalising this PACR (see: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information), as well that assumed in the 2024 ISP (see: https://aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp/current-inputs-assumptions-and-scenarios).

[2] AER, *Final decision Transgrid transmission determination 1 July 2023 to 30 June 2028, Attachment 5 – Capital expenditure*, April 2023, p 39.

to undertake early works and development activities on the project before submission of the Contingent Project Application (CPA).

Identified need: ensuring fault levels at four substations comply with regulatory requirements

The system standards set out in Schedule 5.1a of the NER stipulate fault clearance times that we have to meet. Specifically, Schedule 5.1a.8(a)(3) requires that faults anywhere within the power system should be cleared sufficiently rapidly such that consequential equipment damage is minimised.

If action is not taken (i.e., under a 'do nothing' base case), the connection of Project EnergyConnect, HumeLink and VNI West, as well as full commercial operation of Snowy 2.0, will lead to increased fault levels at the above mentioned four substations in southern NSW and consequent equipment failure that would breach our requirements under Schedule 5.1a.8(a)(3) of the NER, as well likely significant unserved energy to end consumers in the NEM.

While in reality, we would not 'do nothing' and would instead reduce the fault level by disconnecting some generator units from the grid in the region (including Snowy 2.0) to avoid these consequences, this is not considered a sustainable long-term solution and would be out-of-step with industry standards for substation equipment design

The identified need 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.

No submissions received in response to the PADR and no material developments since the PADR

We published a PADR on 19 December 2024 and invited written submissions on the material presented within the document. No submissions were received in response to the PADR.

In addition, no additional credible options were identified during the consultation period following publication of the PADR, and no material changes have since occurred.

On 21 November 2024, the requirements set out in the Australian Energy Regulator's Regulatory Investment Test for Transmission (RIT-T) Application Guidelines were amended. The amended guidelines now expect a RIT-T proponent to explicitly consider community engagement and social licence during the RIT-T process.

The amended guidelines mean that Transgrid must consider social licence principles in the identification of credible options. Transgrid considers that through early engagement we can begin to build relationships and trust to gain communities input into the planning of a project during the early design phase as part of the RIT-T. When considering an option, Transgrid will involve community in this decision to determine the most likely cost and delivery timeline for the option and uncover opportunities that can deliver sustainable social legacy outcomes, informed by community engagement.

Transgrid is a strong supporter of involving community in the option design process to better gain community acceptance for the option and reduce the risk of delay to project timelines due to community disagreement.

Through earlier engagement we can quantify prudent and efficient social licence initiatives and mitigate impacts on project timing.

The new guideline requirements do not apply to any RIT-T project where a PSCR was published prior to 21 November 2024. As the PSCR for this RIT-T was published prior to 21 November 2024, this RIT-T does not need to consider the new requirements.

Further, Transgrid will be engaging with communities post the RIT-T through other approval processes.

Upgrading existing substation switchgear and earth grid at the four affected substations is the preferred option

We consider that there is only one option from a technical, commercial, and project delivery perspective that can be implemented in sufficient time to meet the identified need for this RIT-T.

Option 1 involves upgrading certain existing substation switchgear and earth grid at the four affected substations to meet the increased fault levels in the network. The upgraded equipment will ensure that equipment failure does not occur and there is no breach of the requirements under Schedule 5.1a.8(a)(3) of the NER (or a need to significantly constrain generation in the region).

The equipment to be upgraded at each site will comprise all equipment that is rated below the expected fault levels at that site. This equipment will be upgraded to fault level ratings greater than or equal to the ultimate fault levels expected at each site.

The scope of works is expected to be carried out between 2024/25 and 2027/28, with commissioning in 2027/28 (when both Project EnergyConnect and HumeLink are expected to have been commissioned and ahead of full commercial operation of Snowy 2.0 in December 2028).

All works would be completed in accordance with the relevant equipment standards with minimal modification to the wider transmission assets.

The estimated capital expenditure associated with Option 1 is $52.1 million (in 2024/25 dollars).

Conclusion

This PACR finds that Option 1 is the preferred option to manage the expected increased fault levels at the four affected substations and to continue to maintain compliance with the relevant equipment standards. This is consistent with the draft conclusion in the earlier PADR.

The estimated capital expenditure associated with Option 1 is $52.1 million (in 2024/25 dollars). Routine operating and maintenance costs are expected to be $260,000 per year. The works are estimated to take two years to complete and be commissioned in 2027/28.[3]

[3] Timing of the works, and consequently commissioning, is subject to the trigger events outlined in the Executive Summary and Chapter 1 of this PACR.

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.

Parties wishing to raise a dispute notice with the AER may do so prior to 27 April 2025 (30 days after publication of this PACR). Any dispute notices raised during this period will be addressed by the AER within 40 to 100 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 'Managing southern NSW fault levels PACR'.