

Fiona Orton
General Manager of Innovation and Energy Transition | Network
Transgrid

By email: [REDACTED]

12 October 2022

CMPJ0627

Dear Fiona,

Technology and capacity uplift OER – Assurance Review

Thank you for the opportunity to assist Transgrid in reviewing and assuring the Options Evaluation Report (OER) for the technology and capacity uplift associated with increased power system complexity in NSW.

Scope of review

Our review considered the following three documents:

- 221005 OER Transgrid technology and capacity uplift.docx;
- 221005 System Security Roadmap OER NPV.xlsx;
- System Security Roadmap_PowerRunner Technical Report v1.1.pdf

The objective of the review was to provide assurance as to whether the proposed investment would meet the requirements for being approved by the AER.

Basis for assurance

Our assurance is based on the merits of the information supplied in the documentation provided. The threshold criteria we have applied is whether the project need and case for investment has been demonstrably made in the OERs, such that the AER would not need to undertake any substantive work to understand or verify the information, data or assumptions.

Statement of assurance

Based on our review of the documentation and discussions with Transgrid's project team and PowerRunner, we accept that there is a reasonable case to be made for investment in a capacity and capability uplift to manage the increasing complexity expected in the power system over the coming decade.

Transgrid has engaged an independent expert, PowerRunner, to assess of the situation, and provide inputs that can be used to evaluate the risk and assess the merits of the proposed expenditure. PowerRunner have used a qualitative approach, based on their subject matter expertise, to derive quantitative inputs for the calculation of risk and risk mitigation. For the subject matter being assessed (increasing system complexity and subsequent risk of system interruptions due to an energy transition from centralised fossil fuel generators to decentralised renewable generators), we are not aware of an available, nor reliable dataset that could be used as an alternative basis for the assessment.

We consider that Transgrid's approach is in line with good industry practice and relies on the assessment of international industry experts with subject matter expertise. Furthermore, based on our review and feedback, Transgrid and PowerRunner have refined several variables used within the analysis to more appropriately reflect the uncertainties involved. This included:

- Reducing the probability of a system black event from 1 in 10 years to 1 in 50 years
- Adjusting the initial probability for minor and intermediate severity events to consider only system security drivers of outages
- Applying no growth in the frequency of system security driven outages after FY30 rather than projecting the FY22-FY30 growth rate forward

Based on our experience, we can provide limited assurance on aspects of PowerRunner's approach and resultant risk quantification. PowerRunner has used qualitative information and their own subject matter expertise to derive quantitative inputs for the calculation of base case risk and risk reduction with the proposed investment. Whilst we recognise the inherent limitations of this approach, we equally appreciate that there is no adequate source of quantitative data for these inputs. We understand that PowerRunner has international subject matter expertise in this area and therefore, are well placed to advise Transgrid on the reasonableness of values to be used in the absence of quantitative information sources.

Whilst we agree with PowerRunner's assertion that the growth in complexity of the system contributes to an increasing probability of system security loss of supply events; we cannot assure that appropriateness of the aspects of the approach applied by PowerRunner that involve the conversion of a qualitative assessment to quantitative values to calculate the subsequent increase in probability of system security loss of supply events is. These aspects are:

- The assignment of limited/moderate/high levels of complexity growth to each focus area for each underlying driver of complexity and the percentage values (50%/100%/150% respectively) applied to each level
- The assumption that the sources of the increase in complexity and the resulting complexities are independent such that the resulting increases can be summated to produce a total complexity growth factor.

It is our view that although additional documentation detailing how PowerRunner arrived at the values used would provide increased confidence in the NPV result, it is not feasible for a fully data driven NPV to be calculated. In the absence of reliable data from which to form a robust quantitative validation of the investment, the justification for the proposed investment needs to be appraised by knowledgeable and experienced personnel that understand the context and risks. In this respect, Transgrid's approach of engaging an independent expert to make an appraisal of the situation and propose remedial actions to address intolerable risks represents good industry practice.

Accordingly, and notwithstanding the aspects of the approach that we cannot fully assure, we have found no reason to believe that Transgrid's proposed investment in technology and capacity uplift to address the increasing complexity of the power system in NSW is not warranted.

Please do not hesitate to contact me if you have any queries.

Yours sincerely,

[by email]

Ryan Dudley

Principal – CutlerMerz

