

16 August 2022

Submissions
Transpower
22 Boulcott Street
PO Box 1021
Wellington

Via email: nzgp@transpower.co.nz

Net Zero Grid Pathways (NZGP) 1 Stage 1 Shortlist Consultation

Introduction

The Lines Company Limited (TLC) thanks Transpower for the opportunity to submit on the Net Zero Grid Pathways (NZGP1) Stage 1 Shortlist Consultation. TLC acknowledges Transpower is seeking views on several aspects of the project, including but not limited to:

- A staged approach to this major capital investment programme
- List of options for enhancing the capacity of the CNI 220kV corridor and Wairakei Ring
- Choice of preferred option/s

We expect substantial growth in electricity demand and acknowledge there will be long lead times in developing the capacity after the security and reliability of supply have been compromised; hence, we support Transpower's approach to system upgrades to support increased electrification and decarbonisation.

TLC is owned by the Waitomo Energy Services Community Trust (WESCT) and is fortunate to be a community-owned distributor of which we are very proud. As such, we consider the requirements of the community, particularly pricing and quality of supply, and provide support to the King Country community through sponsorships, scholarships, communication, education, and the MARU Trust. We believe that we must ensure our customers' concerns are voiced.

Split Bunnythorpe-Ongarue 110 kV line at Ongarue Project

As per Transpower's analysis, the capacity across the Central North Island 220 kV grid between Bunnythorpe and Whakamaru (CNI) gets constrained. The loading on the Bunnythorpe to Mataroa (BPE-MTR) 110 kV circuit is expected to increase further in future due to increased power flow towards the Upper North Island. Transpower has proposed options to remove the constraints on BPE-MTR, which are:

- I. Permanent System Split with Auto-Changeover Scheme (Transpower's preferred option)
- II. Larger Reactor
- III. Phase Shifting Transformer
- IV. Reconductor the entire BPE-MTR-OKN-ONG-RTO 110 kV circuit

This submission broadly discusses a facilitating project of NZGP1, Split Bunnythorpe-Ongarue 110 kV line at Ongarue, and highlights the impact of the preferred option of Permanent System Split with Auto-Changeover Scheme.

We acknowledge the study and options analysis is at an early stage and is therefore limited in detail. We have provided a summary below of our key observations and considerations that we think are important to include in the next stages of this work.

1. Quality of Supply

The Lines Company (TLC) believe that the implementation of a Normally Open Point at Ongarue GXP to prevent overloading of the Bunnythorpe to Arapuni 110 kV line will impact the overall quality of supply to the customers supply from the GXP's at Ohakune, National Park and Ongarue. Currently, for 110 kV line faults, the faulted section of the line trips off with a minor system disturbance. Under the proposal, customers South of Hangatiki will see an outage of 5 to 10 seconds for each fault occurrence.

2. Impacts on embedded generation

Depending on the type of fault, the effect on embedded generators needs to be studied. Their disconnection from the electricity network may be more extended than the proposed 5 to 10 seconds reclose time to prevent un-synchronised livening of the generators.

The Transpower document indicated that the reclose time will be in the 5 to 10-second range. TLC expect once consultation is completed with embedded generators (KCE/Trustpower for Kuratau, Piriaka and Wairere stations), this reclose time may need to be stretched out to allow for run down and disconnection of generation (item 2 in the "Where to Next List").

3. Impact on Zone Substations

TLC Zone Substation tap changers take time to operate, generally in the 20 to 45-second range. With the potential change in 110 kV voltage being supplied from the Arapuni end of the line, the response time of tap changers will affect supply for a small period of time while they tap up or down as required. TLC can supply Zone-sub data as required for modelling purposes.

4. Impacts of short-term outages

A 5 to 10-second outage will have a negative impact on a large proportion of TLC customers. In particular the Ski Fields operation, timber and meat processing plants. A single trip per year is material and equates to a ~25% increase (in terms of SAIFI) currently experienced by our customers.

We note that the reclose event information provided on page 9 of the 110kV System Planning document NZGP (Net -Zero Grid Pathways - May 2022) shows only the unsuccessful auto recloses and does not provide visibility of the occurrences when protection operated successfully to remove a faulty section of line. We would like to understand this fully to accurately assess the customer impact.

5. Options analysis and refinement

TLC would like to highlight that at this stage, we have not been provided with the cost estimates associated with the other options listed. Our expectation is that these will be investigated and costed in the next stages of the consultation process to enable TLC and other affected parties to consider their merits.

6. Voltage Studies

To provide a better impact assessment, TLC would like to see the modelling that has occurred regarding pre/post fault voltages as TLC has a number of different tap change systems and control systems that need to respond to a step change in voltages. Under the split system, reclose times are in the 5 to 10 seconds; once power is restored, the response time of some tap changers is more in the 30 to 60-second range as they are delayed before they start operation.

7. Reclose time

We also note that the reclose times and the expected/predicted reliability of the 110 kV system have not been provided.

Summary

Our customers are important to us, and we aim to manage a reliable power supply for them. We look forward to engaging with Transpower and stakeholders on future phases of the Net Zero Grid Pathways NZGP programme and the specific topic areas of interest/concern to TLC and our customers.

If you have any questions on this submission, please don't hesitate to get in touch with Tony Hollart at tony.hollart@thelines.co.nz.

Your Sincerely

A handwritten signature in blue ink, appearing to read 'C Hackett'.

Craig Hackett
Acting Network Manager