

BEFORE THE HEARINGS PANEL

UNDER THE

Resource Management Act 1991

IN THE MATTER OF

the Proposed Far North District Plan

**STATEMENT OF EVIDENCE OF RUSSELL WARREN FERNANDES ON
BEHALF OF TOP ENERGY**

HEARING STREAM 6 & 7

Top Energy

7 October 2024

GREENWOOD ROCHE
LAWYERS
AUCKLAND
Solicitor: F M Lupis
(francelle@greenwoodroche.com)

Level 6, Hayman Kronfeld Building
15 Galway Street
Auckland 1010
PO Box 106006
Auckland 1143

1 INTRODUCTION

- 1.1 My full name is Russell Warren Fernandes.
- 1.2 I am currently the Network Maintenance Manager at Top Energy Limited (*Top Energy*). In that role, I am responsible for:
- (a) management of all aspects of the company's maintenance management policy, process and strategy within approved budgets; and
 - (b) leading the investigation of network incidents that result in service interruptions or degradation for consumers and ensure that lessons learned are implemented through preventive actions.
- 1.3 I have a Bachelor of Engineering (Honours) in Electrical and Electronic Engineering and an ongoing Postgraduate Diploma in Applied Management to be completed in July 2025.
- 1.4 I have over 13 years' experience working in the New Zealand Electricity Transmission and Distribution Industry at Powerco, Vector and Top Energy. In that time, I have worked in the following areas:
- (a) Network Strategy and Architecture including Development of technical standards for the design, operation, construction and maintenance of the electricity distribution networks.
 - (b) Network modelling and economic feasibility studies as a Planning Engineer.
 - (c) Design of protection systems for electricity distribution networks.
 - (d) Asset Engineer managing ground-mounted and underground assets on electricity distribution networks involved in specifications, failure investigations, planning and design and long- term management of assets i.e. "Asset Management".

2 SCOPE OF EVIDENCE

2.1 My evidence addresses submission (#483) and further submission (#FS369) by Top Energy on the Proposed Far North District Plan (*Proposed District Plan*), as relevant to Hearing Streams 6 & 7 and in particular addresses the following:

- (a) overview of the Top Energy network;
- (b) maintenance undertaken by Top Energy;
- (c) Proposed District Plan;
- (d) concluding comments.

3 OVERVIEW OF THE TOP ENERGY NETWORK

3.1 The Top Energy electricity lines network in the Far North district services an area of 6,822km² and serves over 32,000 customers. The current electricity lines network is made up of 110kV, 33kV, 22kV and 11kV lines (4,016km in total) and includes 17 substations. The extent of Top Energy's network is shown on Figure 1 below.

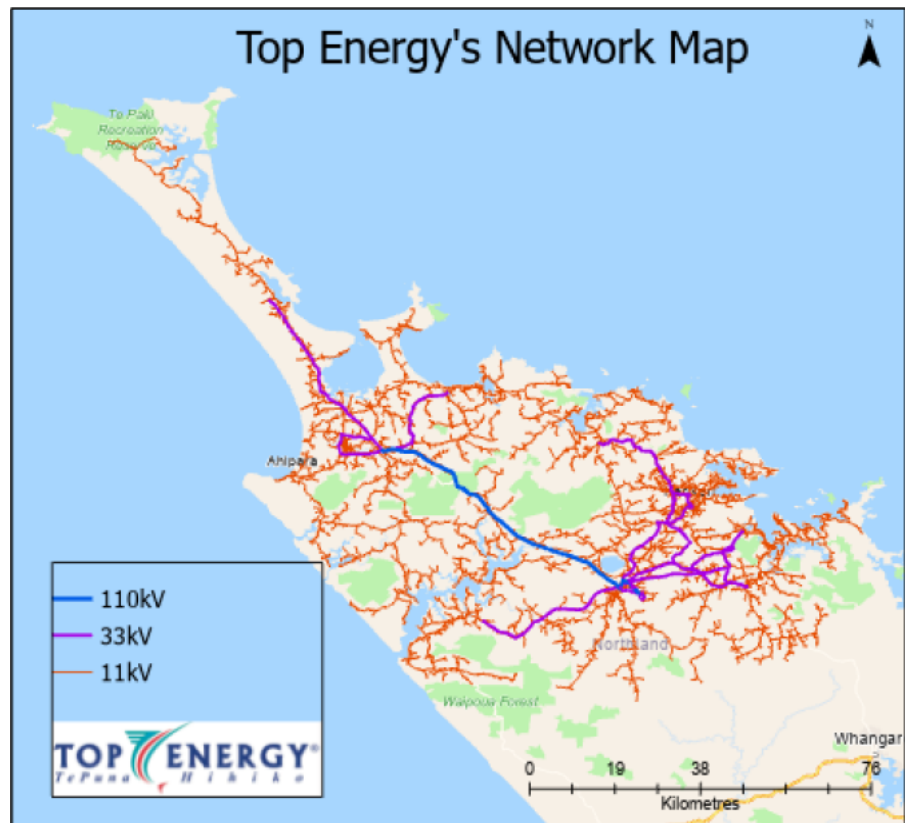


Figure 1: Top Energy's electricity distribution map, showing the extent of 110kV, 33kV, 22kV and 11kV lines.

- 3.2 As the major electricity distributor in the Far North district, Top Energy has responsibilities under the Civil Defence Emergency Management Act 2002 as a lifeline utility to provide essential infrastructure service to the community.

Role of generators within the network

- 3.3 Generators play a critical role in enabling Top Energy to maintain power supply for the Far North district community.
- 3.4 The 110kV line (which forms the "backbone" for the rest of the grid) undergoes scheduled maintenance on an annual basis. As discussed further below, other parts of the network are also subject to regular maintenance. During those occasions, generators are used to provide continuous power for the district, preventing widespread outages across the northern network. That operation is vital for essential services (hospitals, telecommunications), but also for the economic wellbeing of the district.

- 3.5 Top Energy services significant industrial customers who depend on the reliable supply of electricity from the network. Juken New Zealand (JNL) owns and runs a wood processing facility, which is a significant employer for people in Kaitaia. JNL depends heavily on a reliable power supply from Top Energy to: ensure safe plant shutdowns; prevent equipment damage; minimise economic losses; and maintain essential operations with limited power in the facility. Again, where disruptions to the main electricity supply occur (owing to maintenance or an emergency), generators are essential for enabling continuing support for those activities and the economic and employment function they offer.
- 3.6 As a lifeline utility, Top Energy is required to ensure vital services are operational during and after emergencies. This includes maintaining water supply, streetlights and other infrastructure critical for public safety and well-being. Generators are an essential part of Top Energy's response in those circumstances. If, for example, damage was done to the 110kV or 33kV lines, generators are essential for providing supply of electricity during restoration activities.
- 3.7 In that context, planning restrictions on Top Energy's ability to utilise generators on a flexible basis introduces unnecessary operational constraints, which can, in turn, lead to significant concerns, particularly pertaining to medically dependant customers, supply to critical infrastructure (water, wastewater and fuel supplies) and community facilities (such as hospitals and community lighting). They would also compromise the economic and social welfare of the Far North district which relies on the provision of electricity, particularly in cases of emergency.

4 MAINTENANCE OF THE NETWORK

- 4.1 Top Energy undertakes regular maintenance of the electricity grid network because:
- (a) it ensures reliability and provides support during 'unplanned' power outages;

- (b) faulty, or damaged grid components cause serious safety risks to workers and the general public, and regular maintenance activities minimise those safety risks;
- (c) the grid, over time, will become less efficient due to poor connections, wear on transmission and distribution lines and naturally degrading equipment results in higher energy loss; and
- (d) the lifespan of infrastructure will improve if regularly refurbished.

4.2 Generators may be utilised to supply electricity during planned maintenance works to minimise disruption to infrastructure, public services and consumers. During these events, generators may be used up to 12 hours per day. However, the requirement for generation will vary based on the annual works plan and the impact of the outage.

4.3 Generation may be required for the following activities:

- (a) planned conductor replacement, where outages are planned over several days or weeks;
- (b) other planned asset replacement (such as poles, crossarms, switchgear, transformers), where a large number of assets are impacted, and outages are planned over several days or weeks; and
- (c) mobile generators may be utilised to maintain supply to critical infrastructure, community services (hospitals, schools), and medically dependent customers.

4.4 In addition to maintenance testing on the electricity network, Top Energy undertakes standard maintenance on the generators to ensure reliable operation when they are required.

Typical maintenance testing regime

4.5 The standard maintenance practices for generators involves:

- (a) Every month: A routine test done in-house for 20 minutes to ensure the generator runs smoothly, both locally and remotely.

The technicians will check for leaks, fluid levels, drive belts, alarms and running hours. Any issues found are reported for remediation.

- (b) Every three months: Contractors inspect wiring, the battery, oil, fluids, heaters, fans and water pumps for about 30 minutes. Minor repairs are made if needed, and oil and coolant samples are taken for analysis.
- (c) Annual check: The most detailed service with specialised teams taking approximately 30 minutes. The filters and fluids are changed, bearings and engine mounts are checked, and more in-depth electrical and mechanical tests are carried out. This includes testing parts such as the valve lash and performing a load test. Any defects are fixed at the time and all control configurations are backed up.

4.6 Any additional time required to diagnose and fix defects is dependent on its usage over 12 months. For example, if the usage is higher, a scheduled 12-month maintenance check may occur after 250 hours of run time. The additional time required to address issues on the generators varies significantly from less than half a day, to several days if there are several individual issues, or more complex concerns are raised.

Actual generator running hours

- 4.7 There are five generator sites across the Top Energy network, located at:
- (a) Bonnetts Road (eight generators);
 - (b) Omanaia (two generators);
 - (c) Kaitaia Depot (three generators);
 - (d) Taipa (two generators);
 - (e) Pukenui (one generator); and

- 4.8 Over the course of a financial year each individual generator is scheduled to run:
- (a) a typical cumulative total of 5 hours for the standard monthly and three-monthly maintenance schedules; and
 - (b) a typical cumulative total of 24 hours, over two days, in support of the annual 110kV maintenance outage days, this use typically only occurs during daytime hours (0700-1900).
- 4.9 The cumulative run time for each generator is typically 29 hours to support routine maintenance. The cumulative running time does not account for planned network maintenance on the zone substation or transmission assets, which are non-regular or variable year to year.
- 4.10 These non-regular or variable events could typically result in 24 additional hours per year, however this will typically occur every 2-3 years.

Mobile generators

- 4.11 Top Energy also has a fleet of small mobile generators to support community services, medically dependant customers or critical infrastructure during planned network maintenance, which may be dispersed across the network.
- 4.12 These mobile generators may average 20 hours of running time of any single generator in any single location in a year for work during planned network maintenance, such as asset replacement and reconductoring. This use typically only occurs during daytime hours (0700-1900).

5 PROPOSED DISTRICT PLAN

- 5.1 The Proposed District Plan as notified proposes to exempt a number of activities from compliance with the relevant noise standards. Of relevance to Top Energy, these activities include:¹

... use of generators and mobile equipment (including vehicles) for emergency purposes, including testing and maintenance not exceeding 48

¹ Proposed District Plan, Noise Chapter, Note 8.

hours in duration, where they are operated by emergency services or lifeline utilities.

5.2 In its submission, Top Energy sought the deletion of the “carve-out” in the above exclusion for “testing and maintenance not exceeding 48 hours in duration”.²

5.3 The section 42A report (*s42A report*) has responded to Top Energy’s submission by recommending the deletion of the 48-hour duration limit as sought, but replacing it with a new 12-hour limit:

... use of generators and mobile equipment (including vehicles) for emergency purposes, including testing and maintenance ~~not exceeding 48 hours in duration~~, where they are operated by emergency services or lifeline utilities, provided that the use of generators for testing and maintenance purposes is limited to a cumulative time of 12 hours per year.

5.4 As outlined above, the cumulative total of testing/maintenance running hours per generator is expected to be approximately 4.776 hours over a 12-month period. However, this total does not account for unscheduled maintenance or emergency events where testing of generators is required, which could result in one, several, or all of the generators exceeding the cumulative total by some margin.

5.5 The restriction, as amended by the s42A report, is unnecessary and potentially very constraining on Top Energy’s ability to fulfil its functions of providing essential electricity services to the Far North district. Flexible operating parameters for the use, testing and maintenance of generators in emergency contexts are critical to those functions.

5.6 The effect of the current Proposed District Plan approach is that testing and maintenance of generators for emergency purposes where that exceeds 12 hours per year will be subject to the noise rules and standards in the Plan. That may trigger the requirement for multiple resource consents, which, operationally, would be very difficult in an emergency context.

² Refer Top Energy’s submission, #483.183.

6 CONCLUDING COMMENTS

- 6.1 Top Energy is required to maintain a reliable source of electricity to ensure the ongoing operation of essential services such as hospitals, telecommunications and water supply, which requires the use of generators when the electricity network is damaged or is scheduled for maintenance.
- 6.2 As outlined in my evidence, there are a number of interconnected components of the network, each requiring regular maintenance to prevent failures and to optimise performance. On those occasions and in cases of emergency, we rely on the use of generators as an essential component of the network to maintain a reliable source of electricity to the Far North district.
- 6.3 While scheduled maintenance of generators is undertaken at regular intervals, the running time for generators is dependent on a number of factors and requires flexibility to enable Top Energy to provide for consistent electricity distribution. That cannot be achieved by the Proposed District Plan's current approach to managing noise from the testing and maintenance of generators for emergency purposes.

Russell Warren Fernandes

7 October 2024