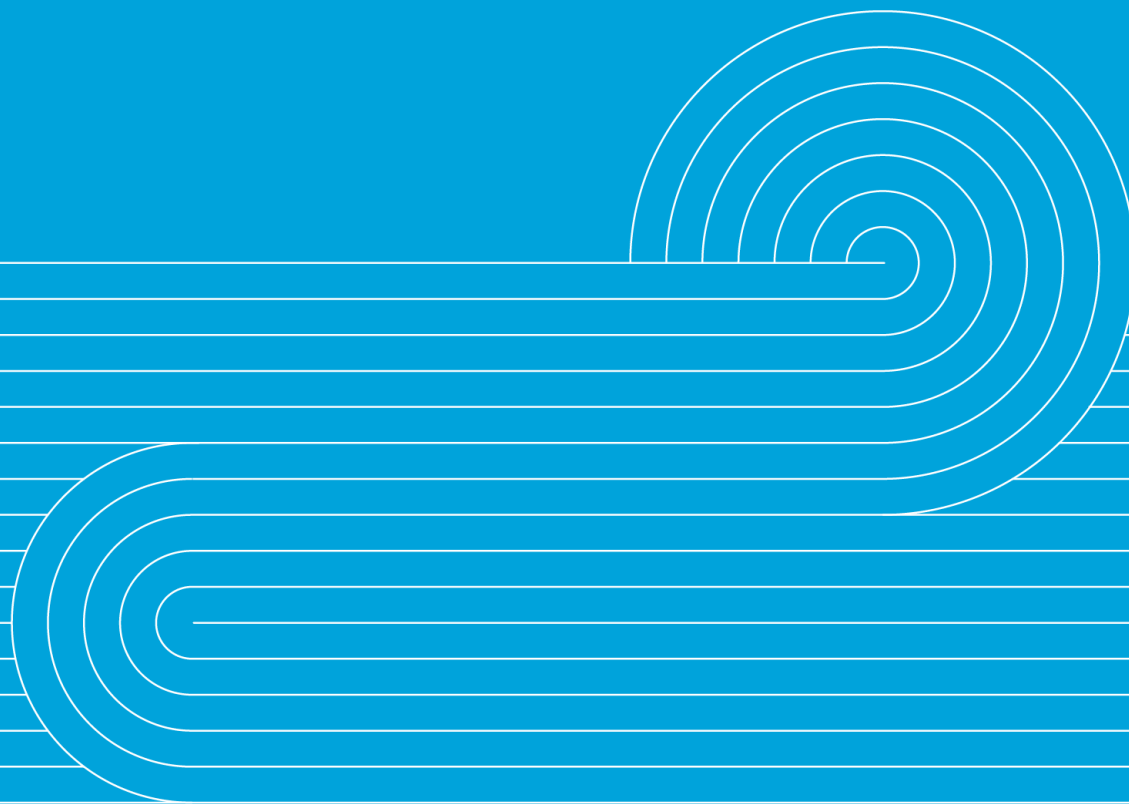




TRANSPower

Annual Outage Planning Forum 24/25

21 March 2024





Opening **Karakia**

Kia tau te rangimarie
O te Rangi e tū iho nei
O Papatūānuku e takoto nei
O te taiao e awhi nei
Ki runga i a tātou
Tihei Mauri ora

Translation

Let the peace
of the sky above us
of the earth laid out here
and of the all-embracing universe
settle upon us
Breathe the breath of life

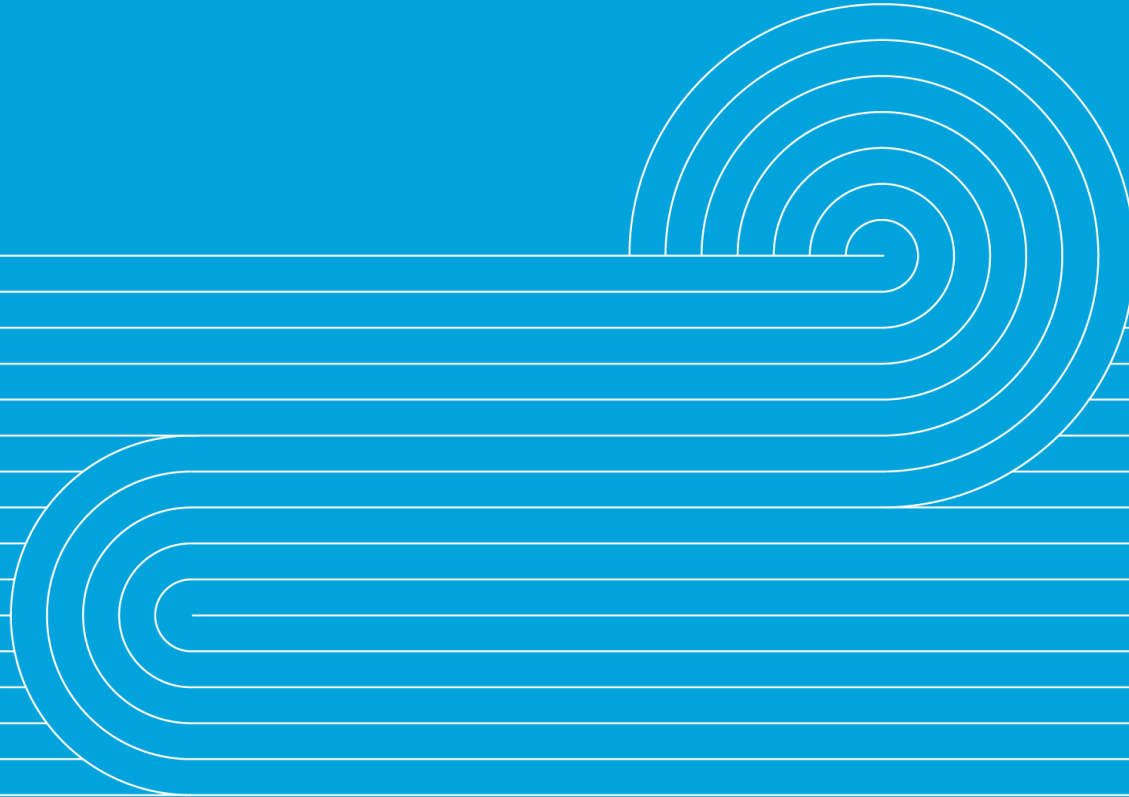
Agenda

Introduction	David Katz	Operations Planning Manager
Annual Outage Plan overview	Angela Houston	Outage Planning Manager
Key Projects	Corin Singh	Planning & Scheduling Manager
Mobile Substation	Dave Brannigan	Service Performance Manager SI
NZGB	Mark Struthers	Operations Planning Engineer
HVDC outages	James Collinson-Smith	Asset Planning Manager
Managing peak winter load / notifications	Matt Hansen	Operations Manager
System Security Forecast refresh	Rommel Reyes	Senior Power Systems Engineer
Upcoming events and close	David Katz	Operations Planning Manager

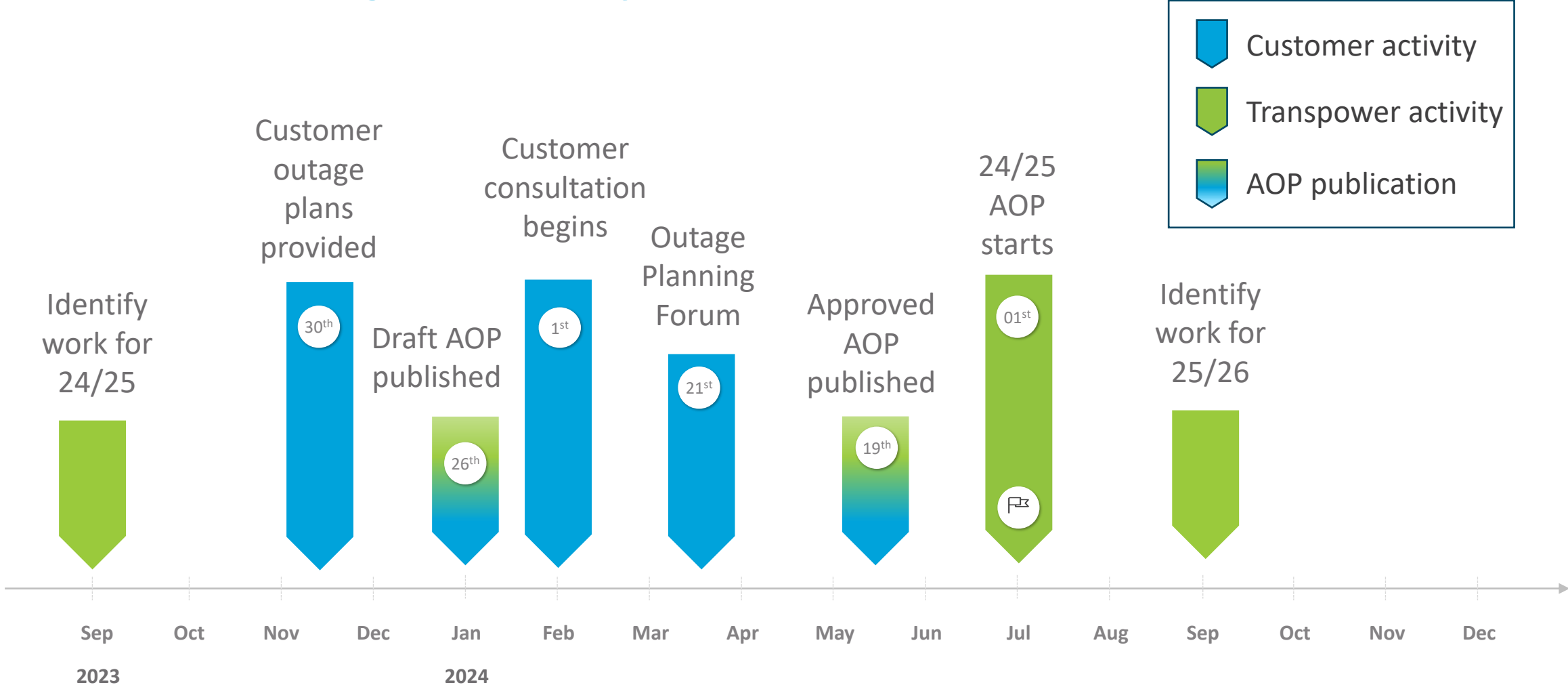
Annual Outage Plan Overview

Angela Houston

Outage Planning Manager



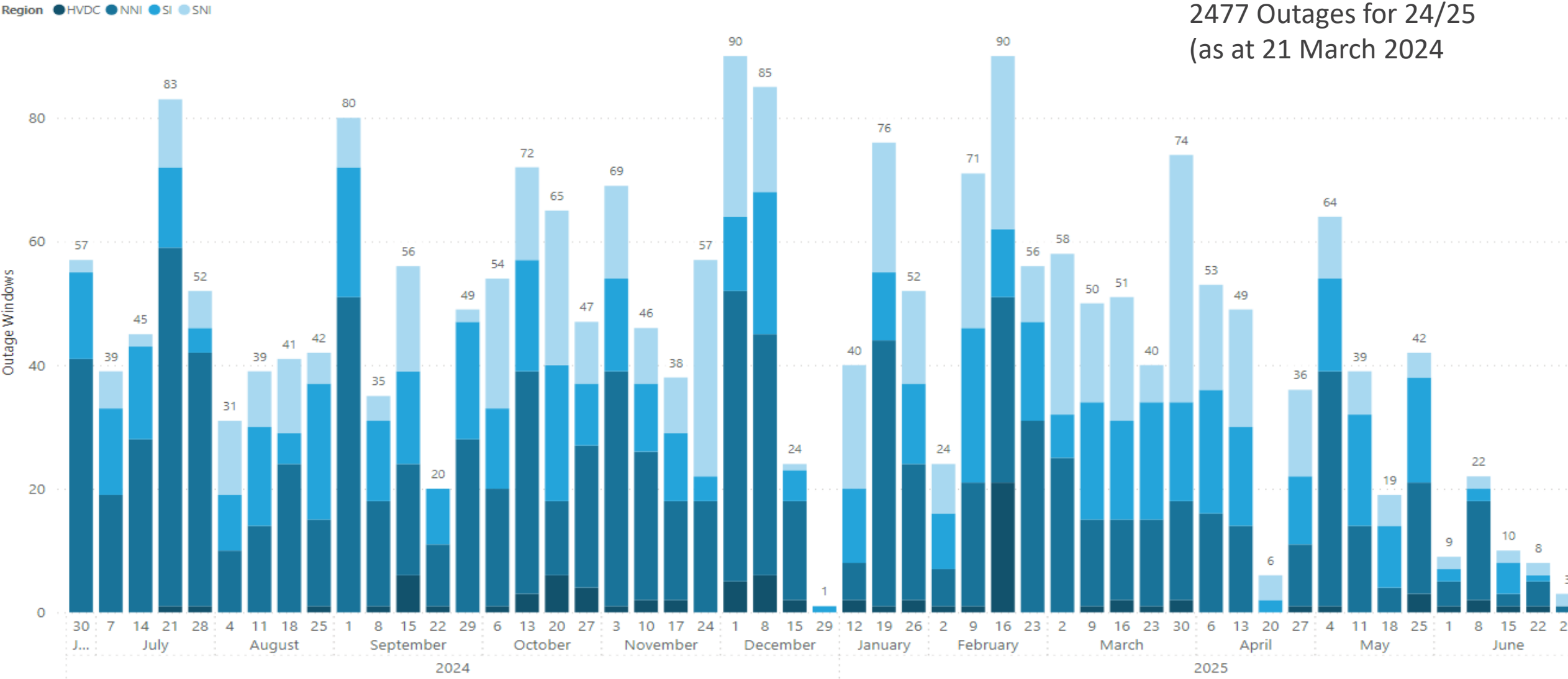
24/25 Annual Outage Plan - key dates



24/25 Annual Outage Plan

Outage Windows per Week, by Region

Region ● HVDC ● NNI ● SI ● SNI



Asset Variation Notices (AVNs)

- Once the Annual Outage Plan is published in May, any changes to the plan will be communicated via an **AVN (Asset Variation Notice)**
- You get AVNs sent to you if you are an interested participant for the associated outage block - let us know if you want to be registered as an interested participant in relation to any assets
- After an AVN is sent, designated Transmission Customers or Interested Participants can request reconsideration of the timing and/or duration of the outage via a **representation** –within 7 business days of the notice
- Transpower will assess the request and follow process in the Outage Protocol
- Customers or interested participants are entitled to request a net benefit test, if they consider the outage does not meet the net benefit principle.

Asset Variation Notices (AVNs)

- Be aware that while we are in the period up until 19th May (when we publish the plan), you won't see AVNs for any changes – but you can see all the outages in POCP
 - Option to set up filters in POCP to be notified of any changes to the outages you are interested in
- Also note SO may request start time delays for system security reasons



Key Projects

Corin Singh

Planning & Scheduling Manager



Upcoming Key Projects

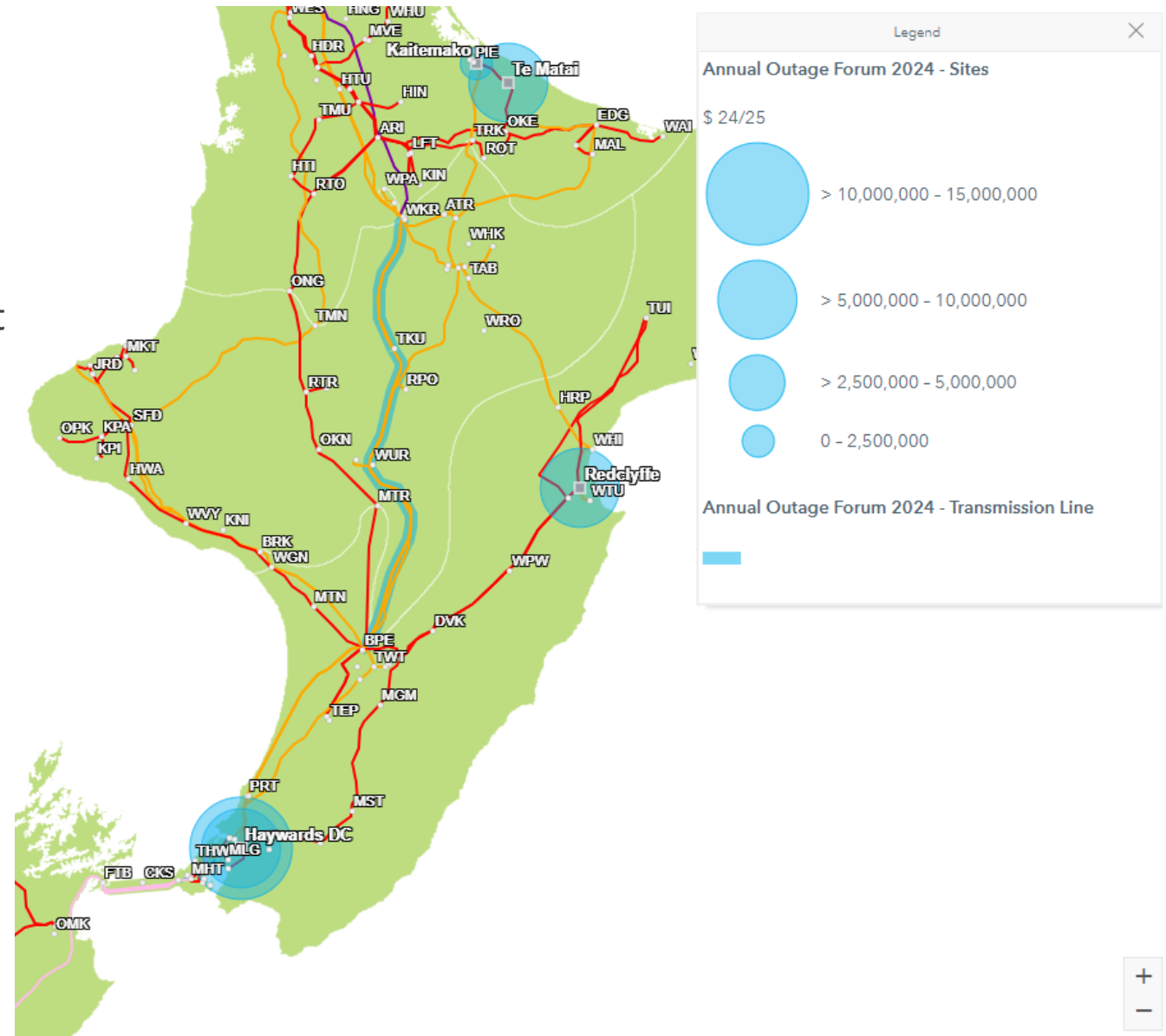
Site

- HVDC Pole 2 Converter Transformer Refurbishment Programme
- HAY-DC SC3 & 4 Auxiliary Systems Refurbishment
- TMI T1 Transformer Replacement
- KMO152 + 112 Line Prot + SPS Replacement
- RDF interconnecting capacity – build*

Lines

- TKU-WKM Lines Thermal Upgrade NZGP- build

* Project not yet in draft outage plan



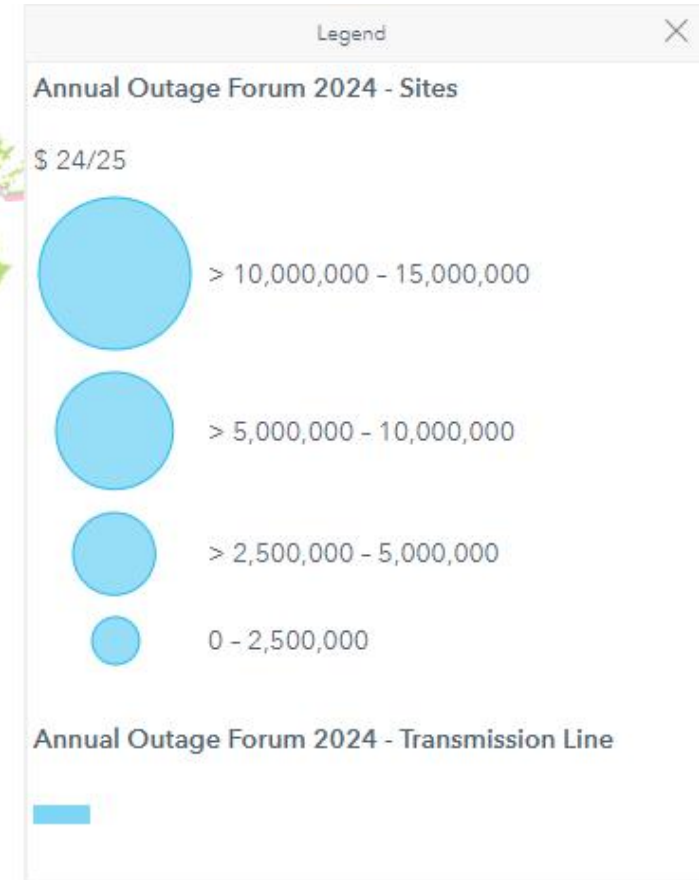
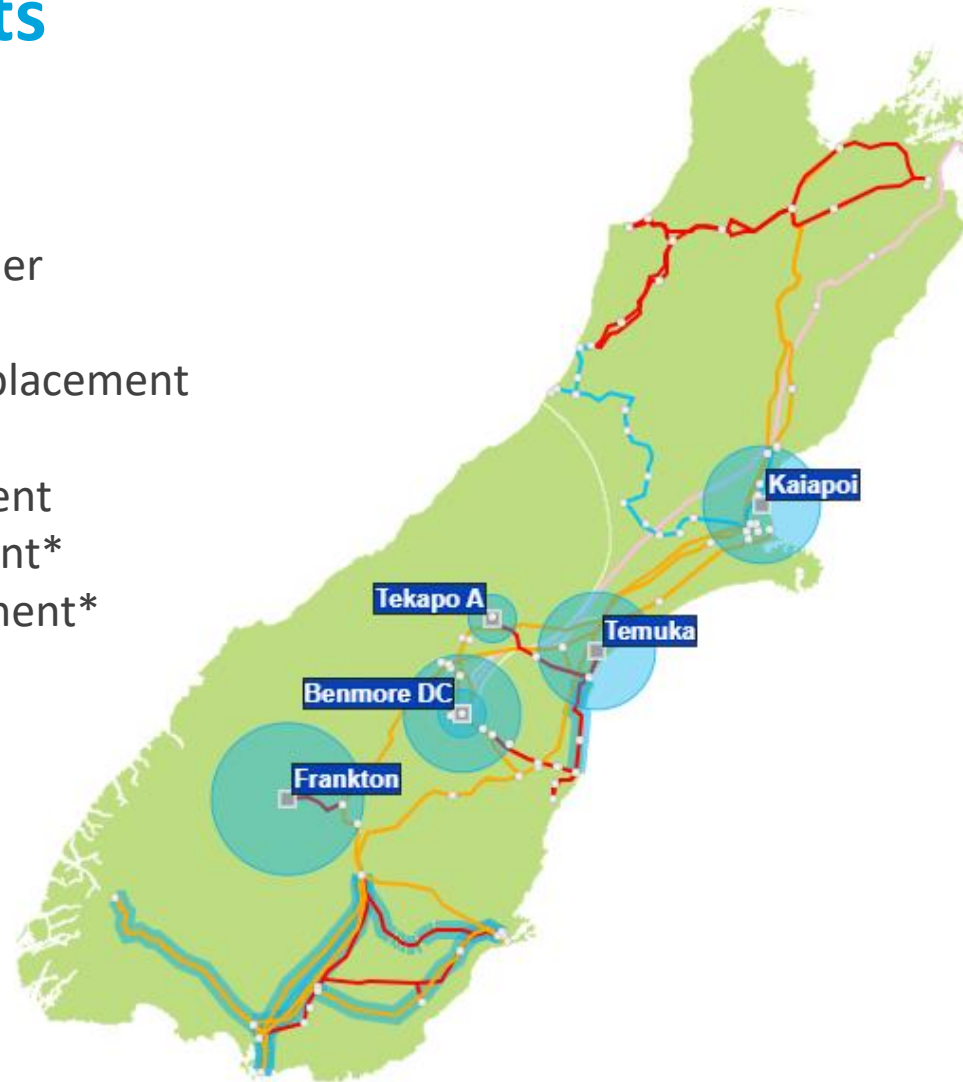
Upcoming Key Projects

Site

- HVDC Pole 2 Converter Transformer Refurbishment Programme
- BEN Pole 2 400V Switchboard Replacement
- FKN Transformer Upgrade Build
- TKA 11kV Switchboard Replacement
- KAI 11kV Switchboard Replacement*
- TMK 33 kV Switchboard Replacement*

Lines

- RSA6 Attach Point Repl 24-25

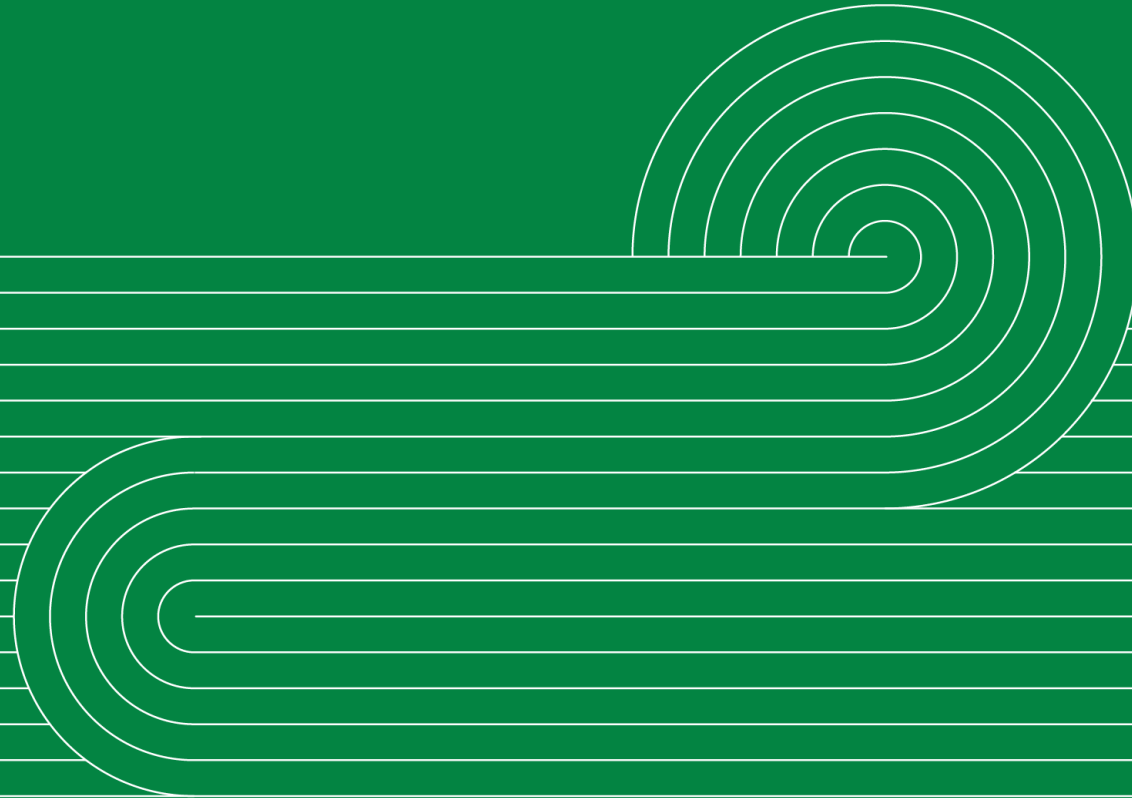


* Project not yet in draft outage plan

Mobile Substation

Dave Brannigan

Service Performance Manager SI



NZGB – NZ Generation Balance

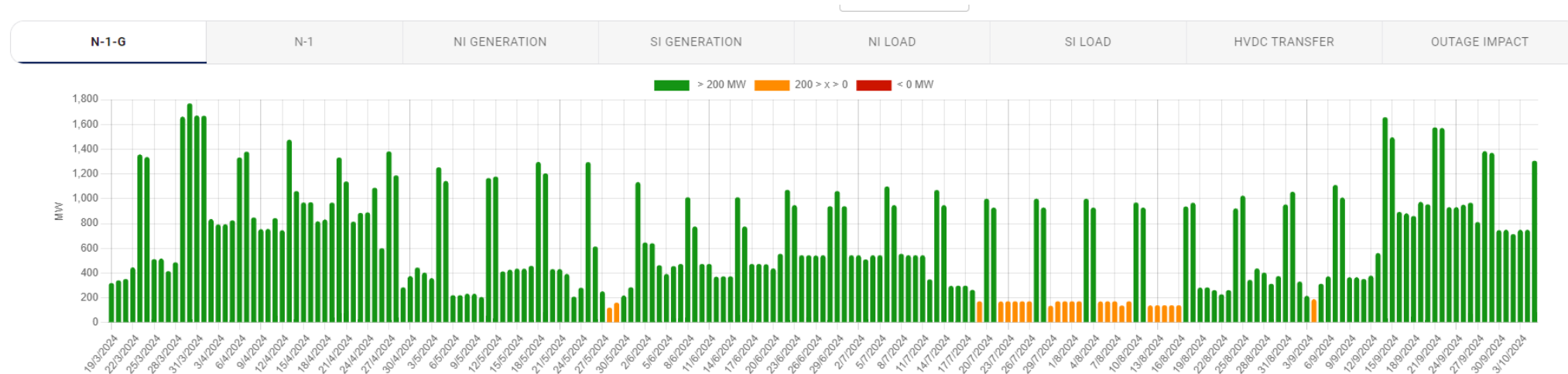
Mark Struthers

Operations Planning Engineer



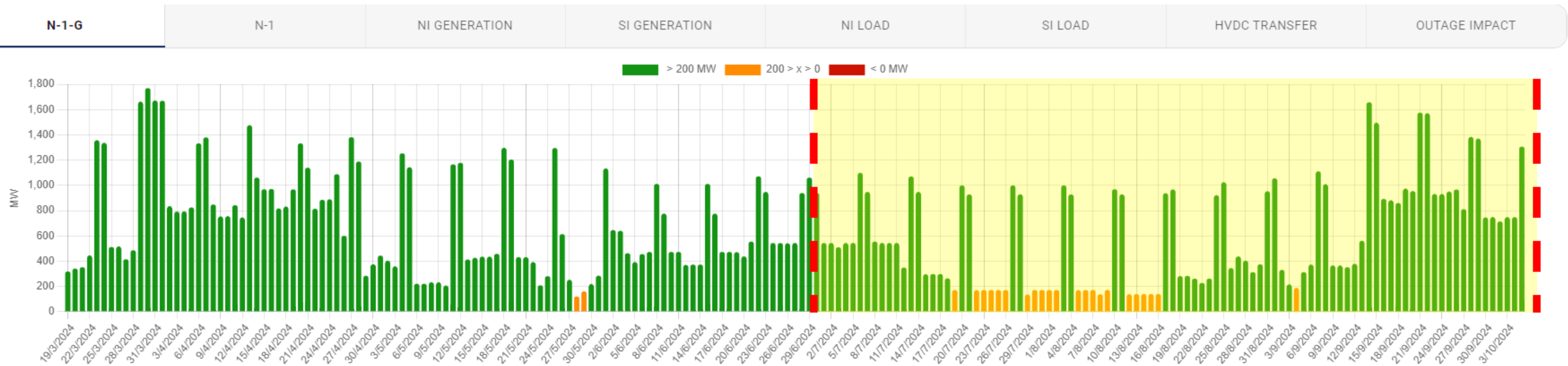
Quick overview

- NZGB forecasts whether New Zealand may have enough generation capacity to meet daily peaks.
- Accounts for,
 - Outages as per POCP
 - Loss of our greatest risk setter (N-1)
 - Loss of our greatest risk setter, if the next largest risk setter were also to become unavailable (N-1-G)



Looking forward with NZGB

- Current results for the next year of outages show no negative balances for N-1-G
 - Periods of low margins in July & August



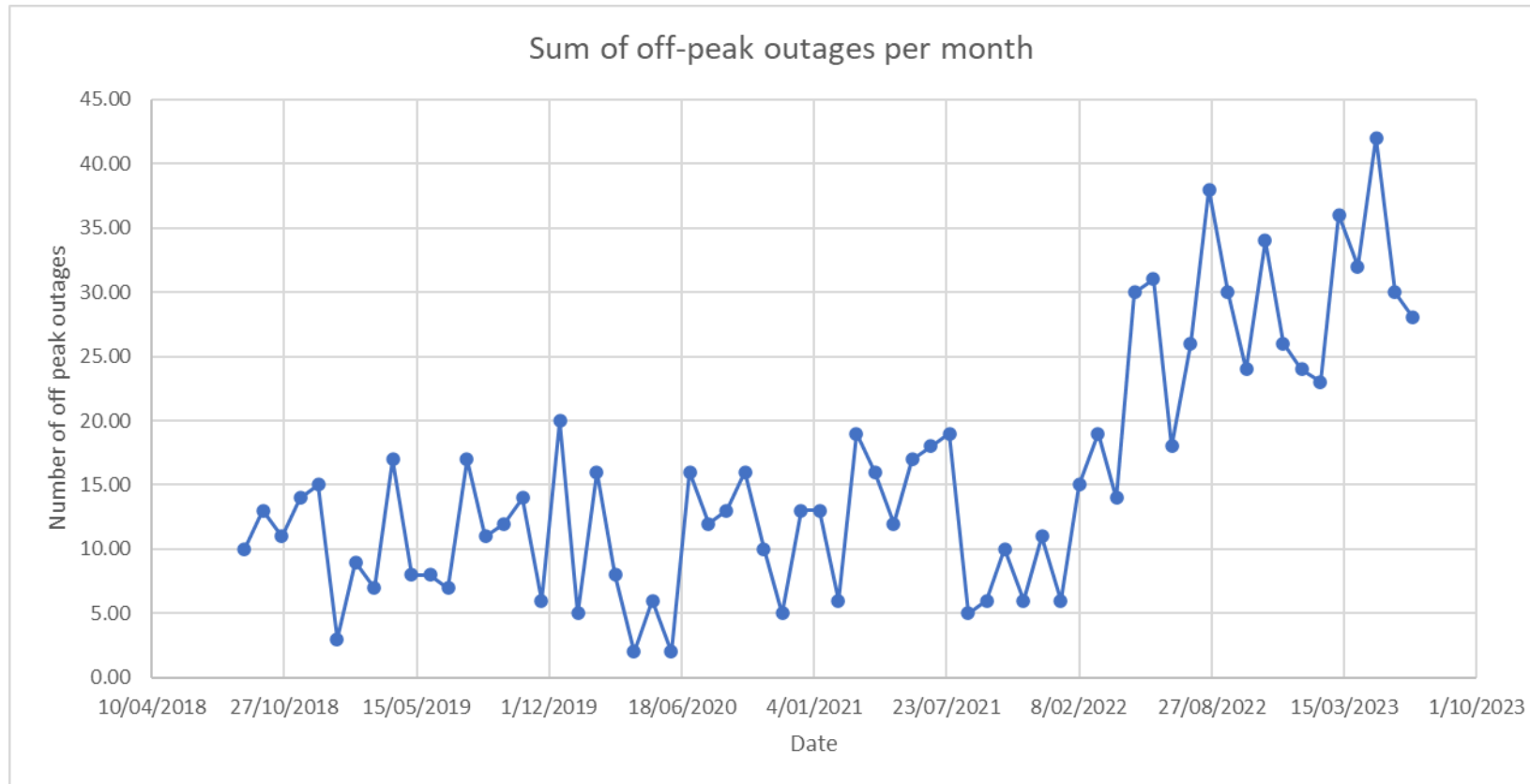
Coming to NZGB...

- Updates to demand / load assumptions
 - Utilise TESLA Weather Risk forecasts
 - Remove Winter Load scenario, and Short Term model
- Updates to supply assumptions
 - Two new supply scenarios – firm generation only, or all generation including wind availability assumptions
 - Remove Low Gas scenarios
- Expect industry consultation soon



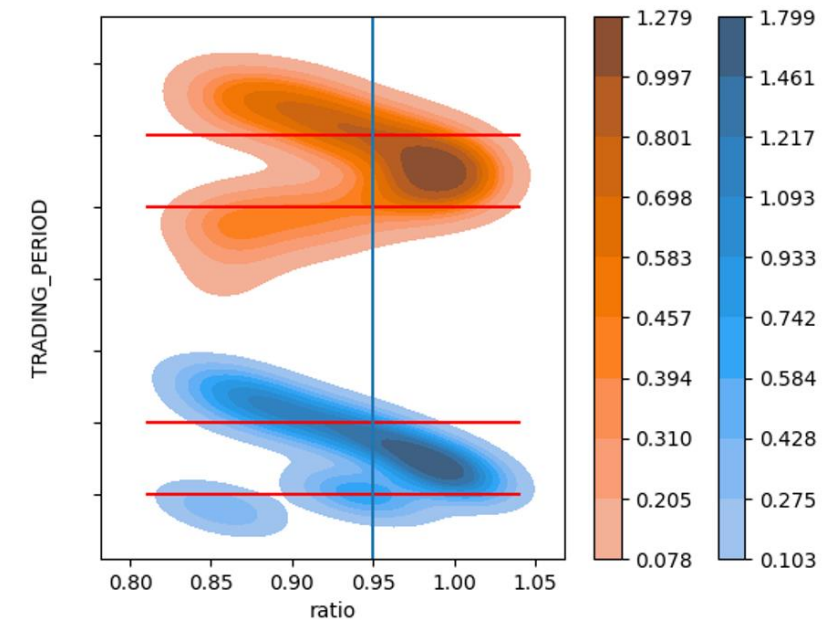
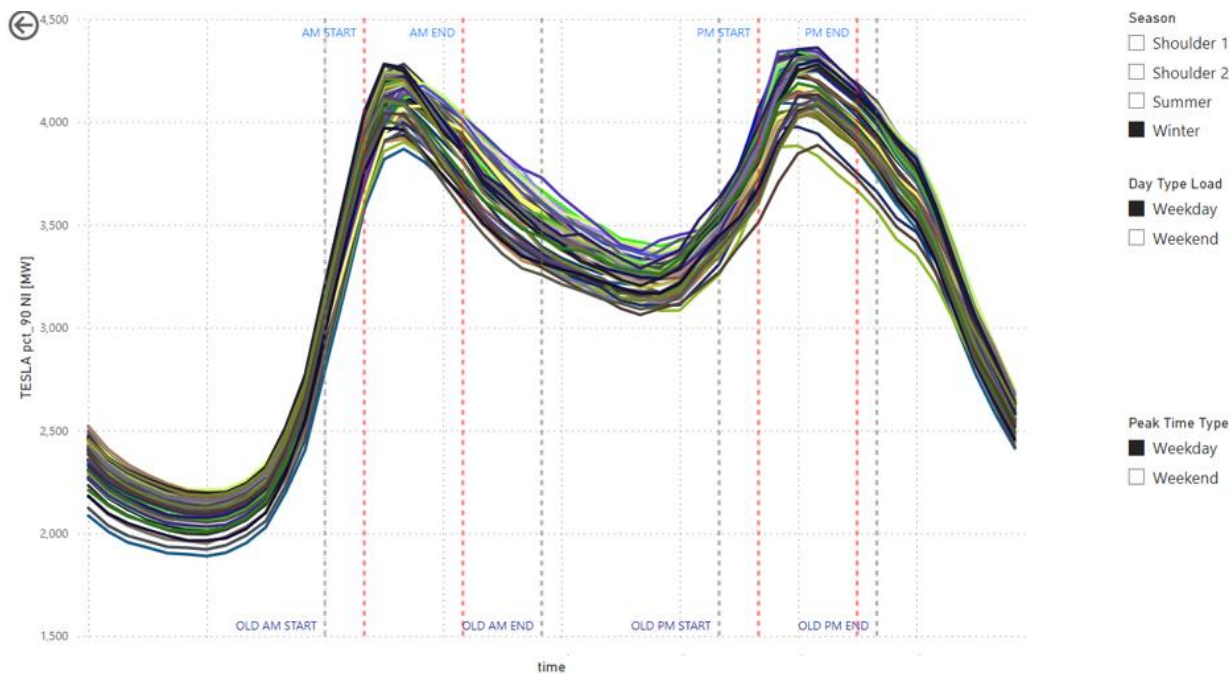
Changes in outage trends

- Daily outages have been increasingly scheduled during off-peak NZGB times
 - Outages during off-peak times do not impact NZGB balances



NZGB changes to reflect accurate peaks

- NZGB AM & PM peaks are quite long,
 - AM: 6:00 – 11:30
 - PM: 16:00 – 20:00
- Investigating seasonal peak times to shorten these



HVDC outages

James Collinson-Smith

Asset Planning Manager

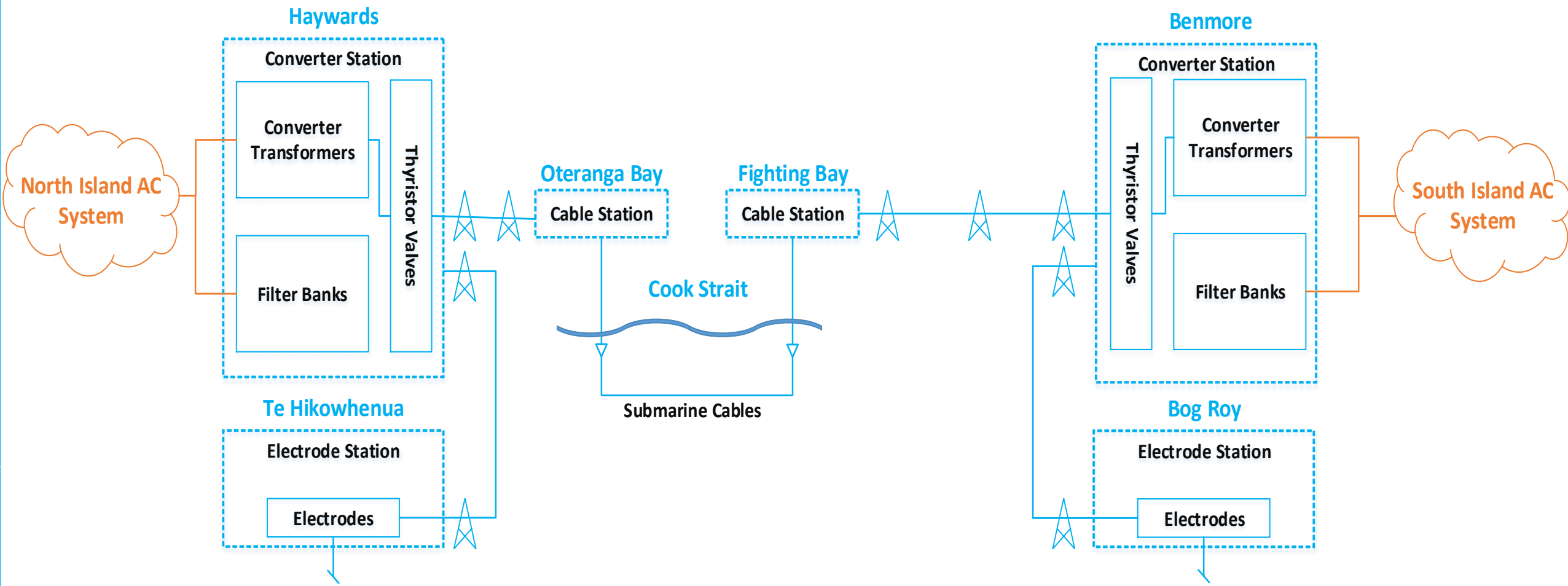


HVDC Outage 2025

Pole 2 mid-life refurbishments

- a summary of planned works

21 March 2024

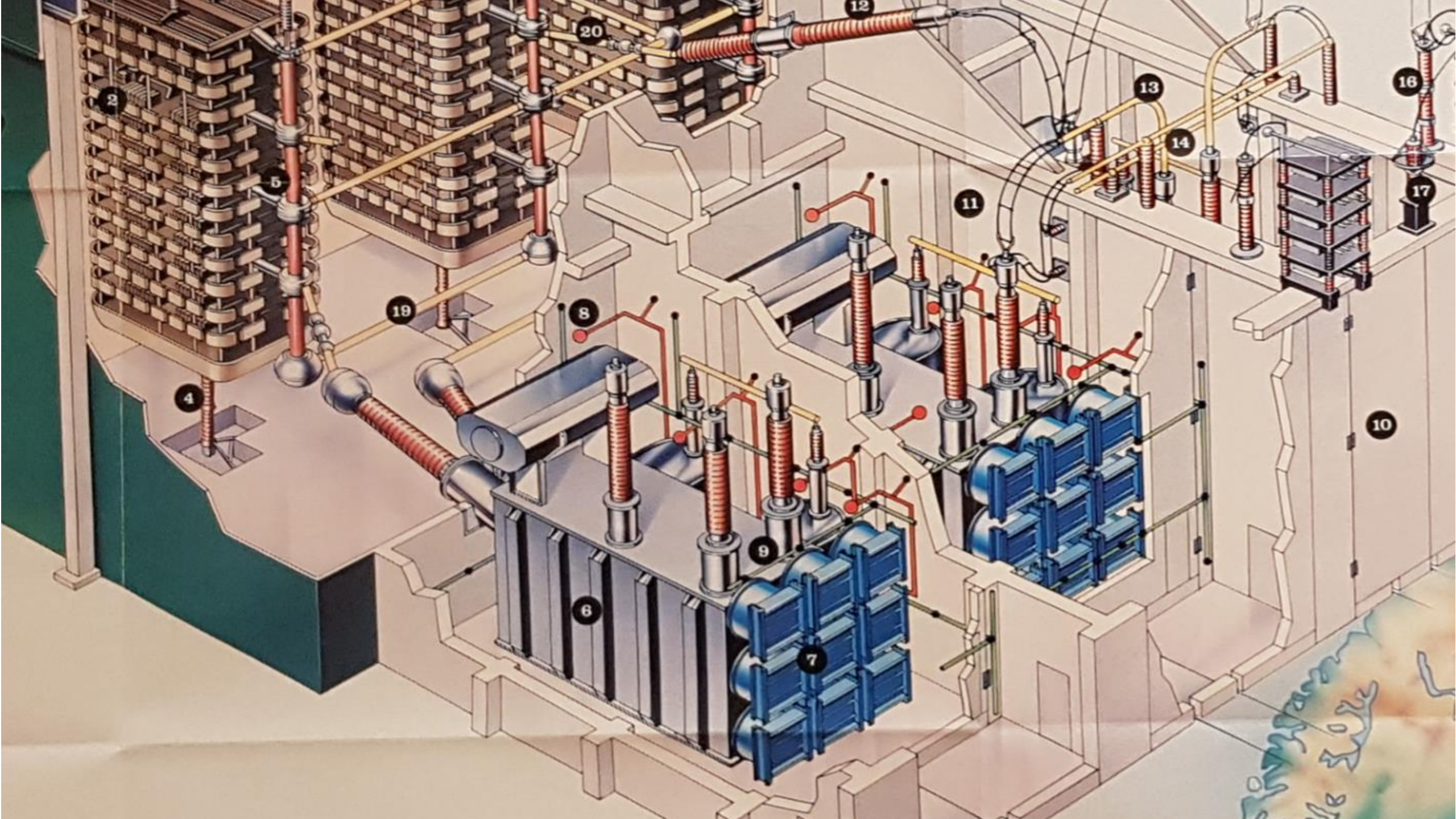


The purpose

To provide a high-level summary of the work being planned for the HVDC Pole 2 mid-Life refurbishments during the extended Pole 2 outage planned in 2025

Why are we refurbishing HVDC Pole 2?

- The HVDC system is a vital part of New Zealand's power system
- Pole 2 was built in the early 1990s with a design life of 30 years. Pole 2 has now been in service for ~30 years and the asset life can be extended for a further 20 years of reliable operation, with refurbishment of key components.



What works are we planning in February - March 2025?

- Pole 3 scheduled annual maintenance and replacement of the roof bushing Oteranga Bay from 20-Feb-25 to 23-Feb-25
- Bi-pole scheduled annual maintenance from 22-Feb-25 to 23-Feb-25
- The Pole 2 refurbishment and scheduled annual maintenance from 22-Feb-25 to 13-Mar-25 at Benmore and Haywards includes:
 - Replace a converter transformer phase with refurbished spare.
 - Replace primary assets – wall bushings, instrumentation and LVAC systems (at Benmore only).
 - Completing seismic improvements of Pole 2 Converter Stations.
- Replacement of components of the HVDC line.

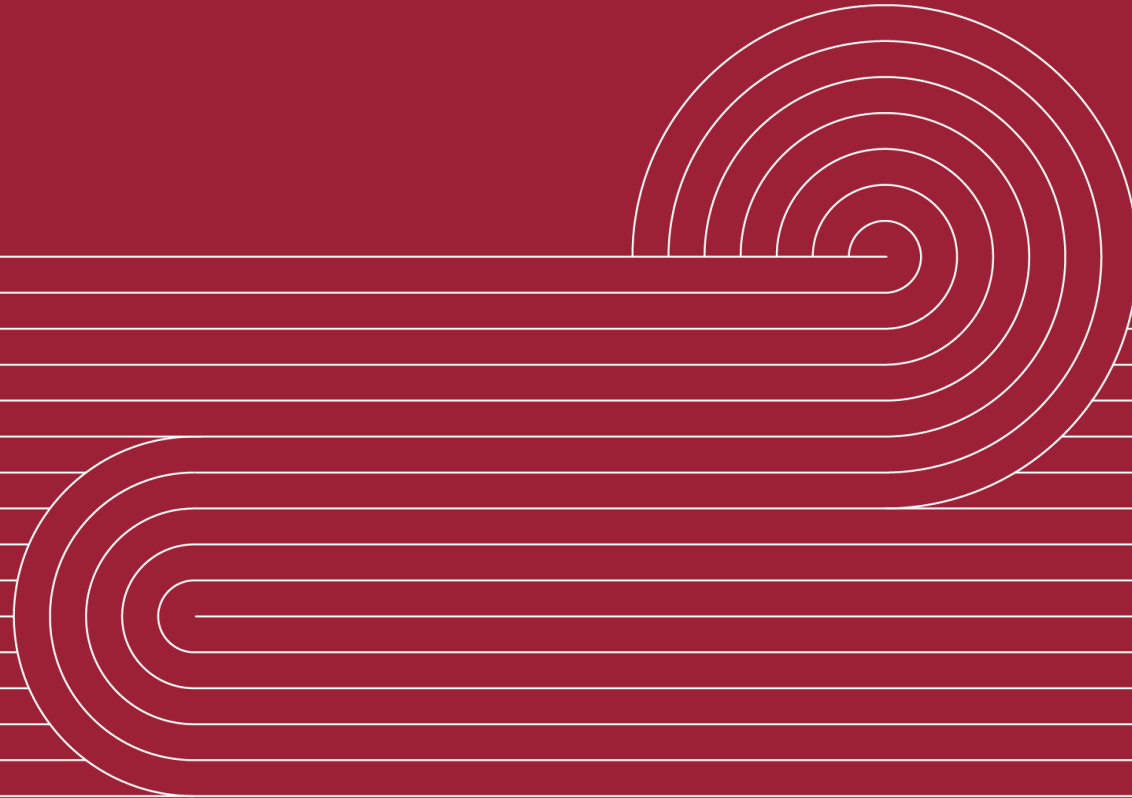
Why do we need long Pole 2 outage in 2025?

- Components of Pole 2 mid-life works need to be undertaken sequentially and cannot be carried out in parallel due to physical space constraints and other dependencies, particularly the following works at Benmore and Haywards:
 - Pole 2 converter transformers refurbishments and instrumentation.
 - Replacements of Pole 2 wall bushings.
 - Seismic improvements of Pole 2 valve hall buildings.
 - Replacement of the LVAC systems at BEN only.

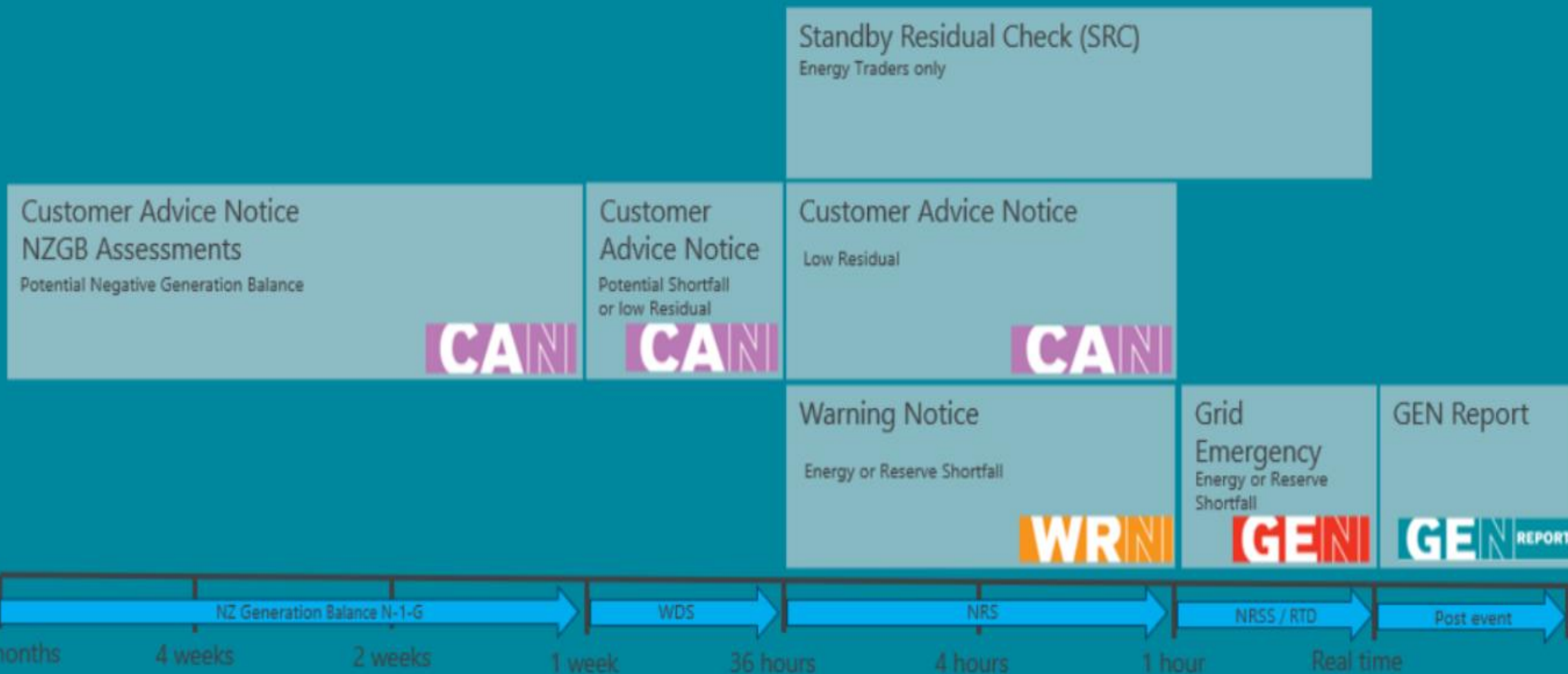
Managing peak winter loads

Matthew Hansen

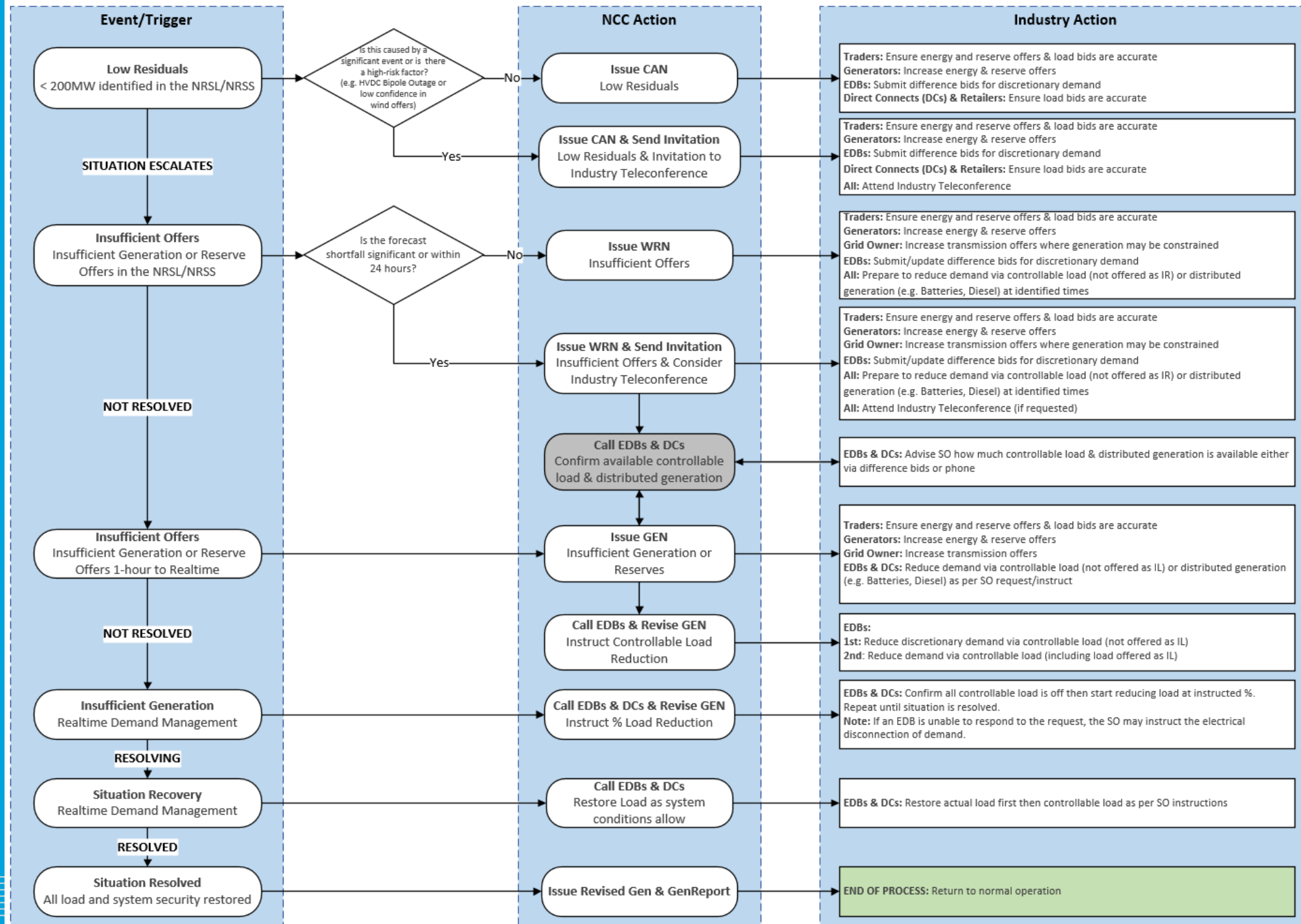
Operations Manager



Market Notices



Energy Shortfall Process



System Security Forecast Refresh

Rommel Reyes

Senior Power System Engineer



Background

Code Obligation

- “..identify risks to the System Operator’s ability to meet the principal performance obligations...”
- “...and indicate how those risks can be managed...”

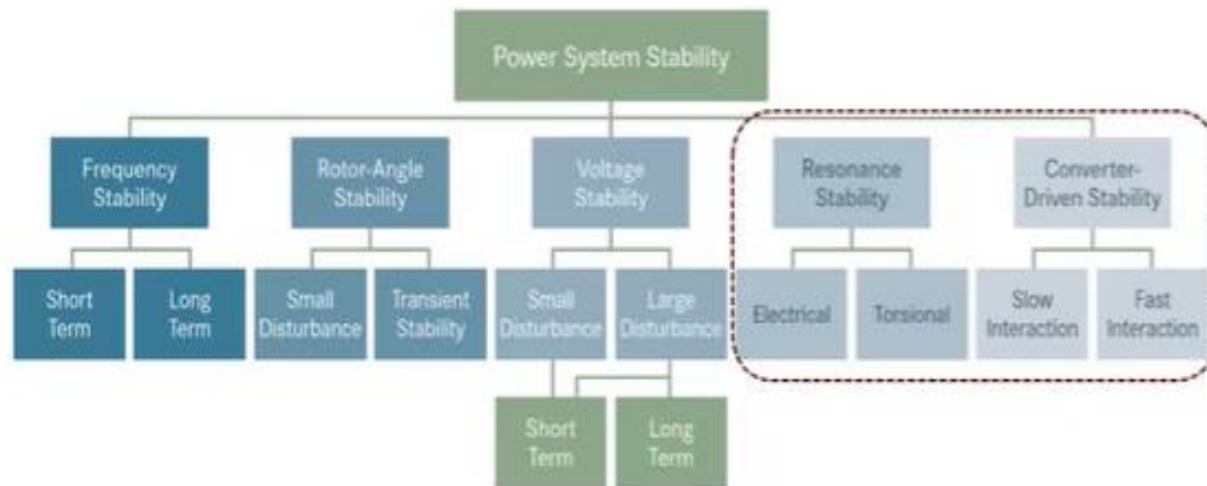
History

- 2004 - First published
- 2011 SFT constraints implemented
- 2012 - Constraints included in the SSF
- 2014 – Alignment of the SSF and TPR

Current Focus

- Avoid cascade failure
- Thermal Limits
- Static Voltage Limits
- Voltage Stability

Change in system characteristics - stability



Power system stability phenomena changes with increase in power electronic interfaced equipment.



New level of accuracy in models, and new ways to analyse, mitigate and monitor are needed.

Existing SSF content assessment

Existing content - remain

- Voltage Stability Limits
- N-1 thermal and voltage limits
- Impact of committed commissioning/decommissioning of assets

Existing content – available elsewhere

- SPS information
- Operational Policies
- List of Standard System Splits

Outage and constraint info – decouple as it is market info

- Standard constraints information (thermal equations)
- Indicative outage information – single circuit outages (N-1-1)

Change of approach - Delivery

- Introduce a review of security risks at the start of each period (2-year cycle)
- Deliver the in-scope content separately in standalone reports
- Publish a 2-yearly summary report of risks to our PPOs
- Spread the delivery load evenly across the 2-year period
- Continue to conduct the 6-monthly review
- Decouple the Outage and Constraints information

Change of approach – Content and Schedule

2024	2025	2026+
<ul style="list-style-type: none">• N-1 thermal and static voltage limits• Voltage Stability• Overvoltage management• Transient Rotor Angle Stability• Issues with commissioning and decommissioning of assets	<ul style="list-style-type: none">• Indicative outage information (optimized)	<ul style="list-style-type: none">• Reevaluate the scope starting from the risks previously identified



SYSTEM OPERATOR / [Planning for the future](#) / System Security Forecast

SYSTEM OPERATOR

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SO projects

Security of Supply Annual Assessment

Strategy

→ System Security Forecast

Information for industry

Notices and reporting

System Security Forecast

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In our role as System Operator, we are required to achieve Principal Performance Obligations (PPOs) agreed with the Electricity Authority. The System Security Forecast (SSF) forecasts our ability to achieve these PPOs over the next three years.

Latest 6 Monthly Update

- [Huntly Rankines Retire 2025](#)
- [Southland Hydrogen Project](#)

2026 System Security Forecast

Date of Last Review:

Date of Next Review:

1.	Frequency Management	Aug 2026	Aug 2028
2.	Voltage Management	Oct 2026	Oct 2028
3.	Commissioning Risk	July 2025	July 2027
4.	System Strength	Jan 2025	Jan 2027
5.	Demand Side	Mar 2026	Mar 2028
6.	Market	Oct 2025	Oct 2027
7.	Stability Risks	Dec 2026	Dec 2028

Risks Managed in Operational Timeframes

[Outage Planning Procedure](#)
[Generation Margins](#)
[Security of Supply](#)



Upcoming Events

David Katz

Operations Planning Manager



Upcoming Events

- The SO is sending the annual System Operator participant survey this week
- 9th April – SO Industry Forum – to cover our approach to managing winter 2024
- 1st May – industry winter exercise – EA led initiative to prepare for potential winter shortfalls
- 19th May – the GO will publish approved Annual Outage Plan
- System Operator Rolling Outage Plan (SOROP) - submissions and cross submissions will be available on the [Invitation To Comment](#) section of our website.



Closing **Karakia**

Unuhia, unuhia,
Unuhia ki te uru tapu nui
Kia wātea, kia māmā, te ngākau,
Te tinana, te wairua, i te ara tangata
Koia rā e Rongo, whakairia ake ki runga
Kia tina! Tina! Hui e! Tāiki e!

Translation

Draw on, draw on
draw on the supreme sacredness
to clear, to free the heart,
the body and spirit of humankind
That is Rongo suspended high above us
Draw together! Affirm!



Thank you

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