TRANSPOWER

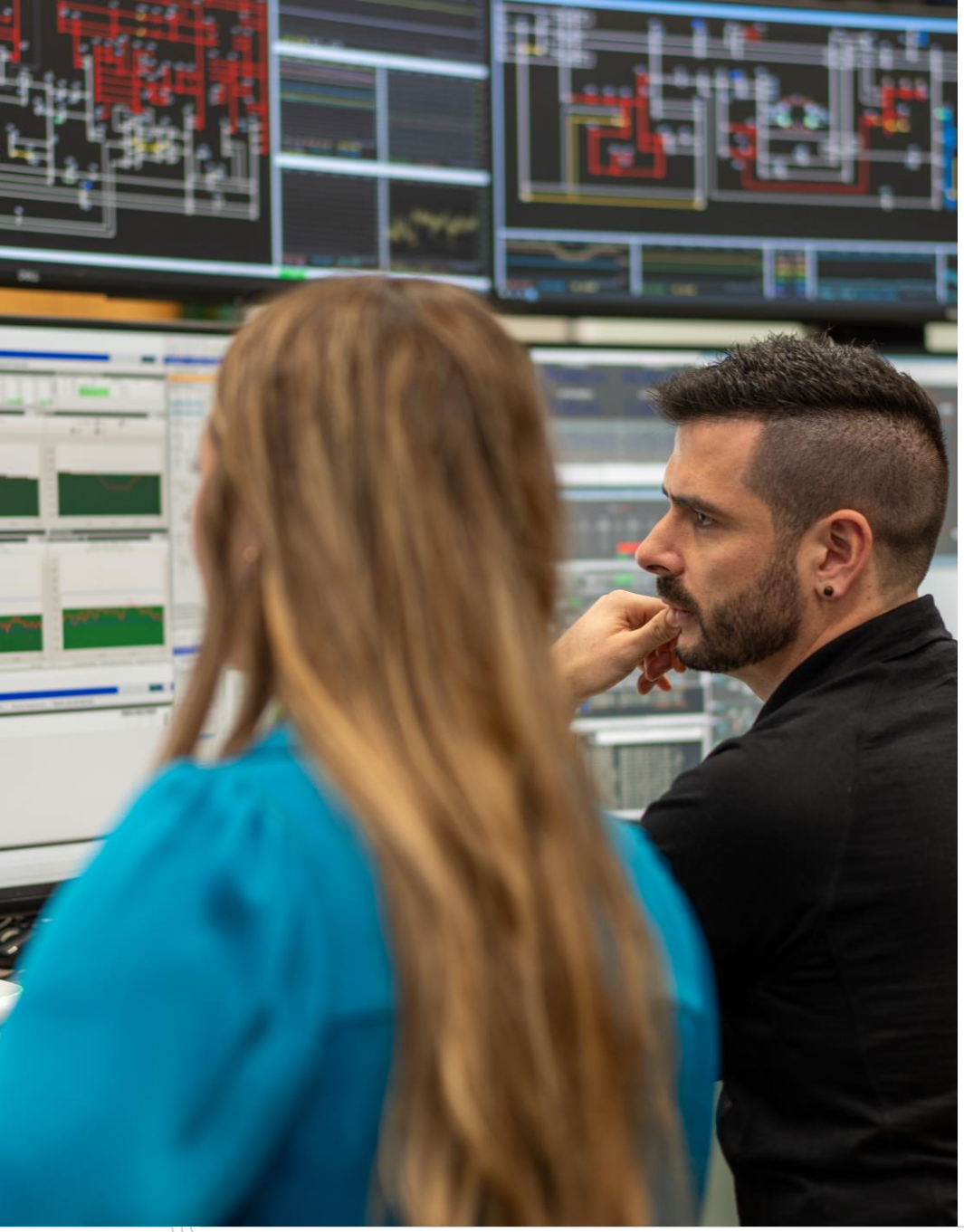
System Operator Industry Forum

2 September 2025

Today’s agenda

Market and Operational updates

- Key messages
- Market update
- Karapiro SPS update
- NZGB update
- Operational update
- CACTIS consultation
- TRAS update
- Consultations, publications and events



Key Messages

- Nationally hydro storage is below the 10th percentile - inflows have lifted the Waiau out of low operating ranges.
- Early spring with demand reducing and daylight hours increasing. Shoulder-season risks remain with potential for cold snaps and timing for spring inflows uncertain.
- Rain/snow in the forecast for the coming days. If storage continues to decline we expect to see more thermal generation.
- Continued focus on fuel (both hydro and thermal) and asset availability is needed to reduce energy and capacity risks.

Market update

Energy: National hydro storage

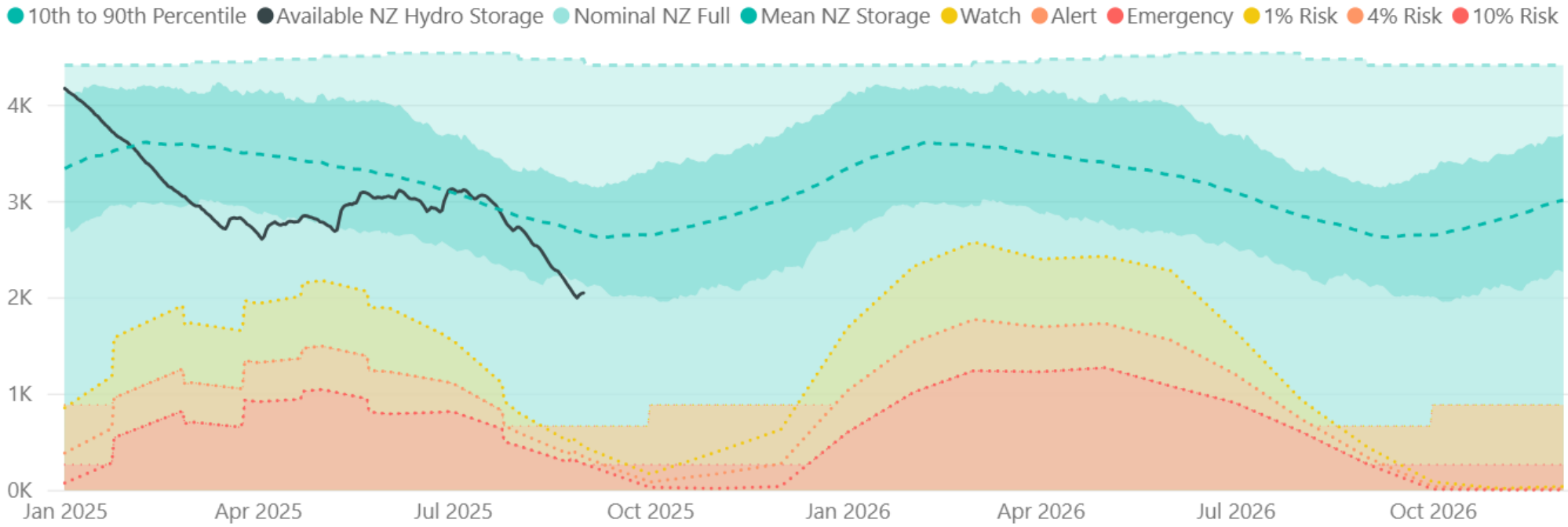
National hydro storage declined rapidly during August. There have been some inflows in recent days, but storage remains below the 10th percentile for this time of year.

	Hydro storage level (% of mean ▲/▼)		
	New Zealand	South Island	North Island
Last forum	90%	78%	117%
Now	77% ▼	73% ▼	104% ▼

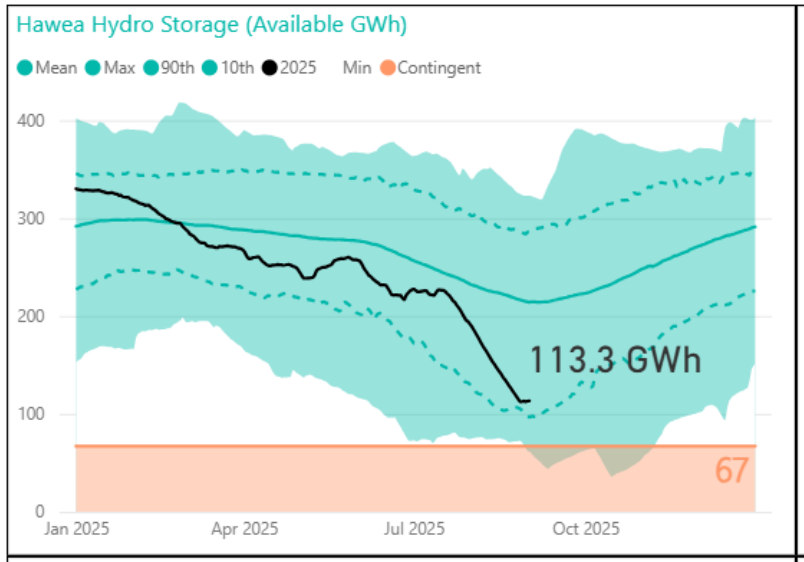
New Zealand Energy Risk

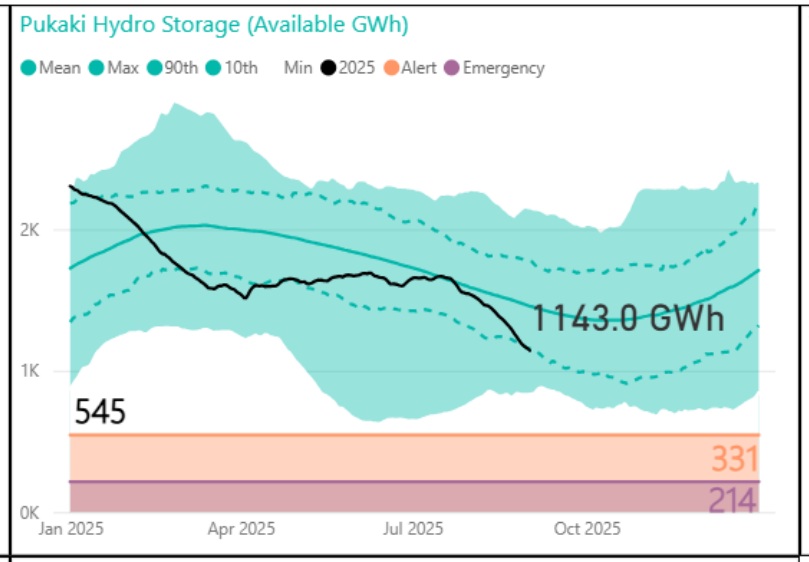
South Island Energy Risk

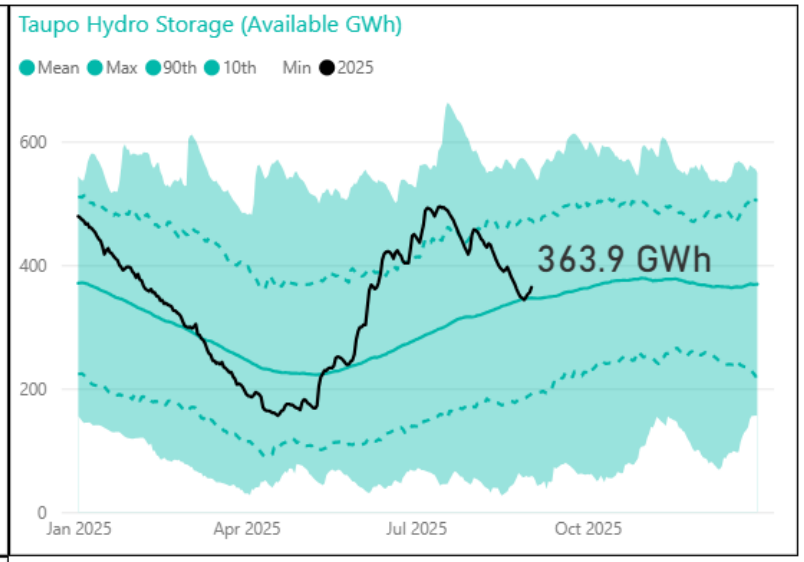
New Zealand Electricity Risk Status Curves (Available GWh)

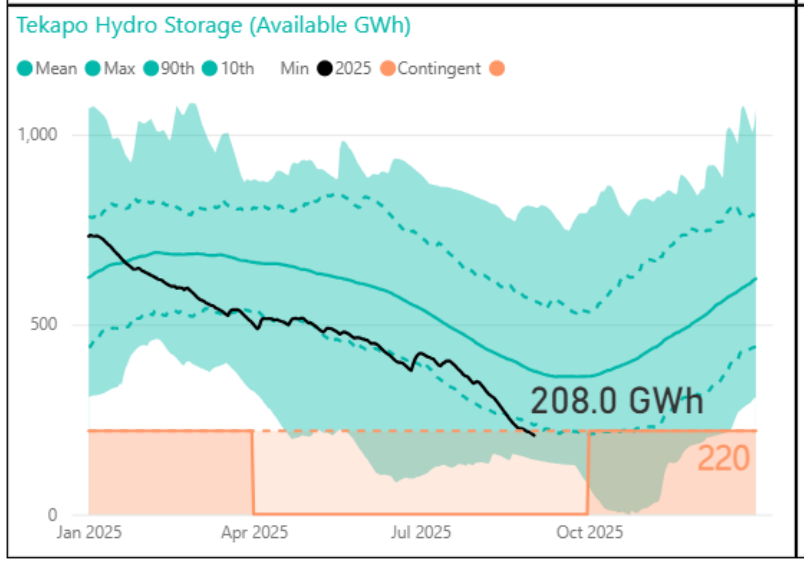


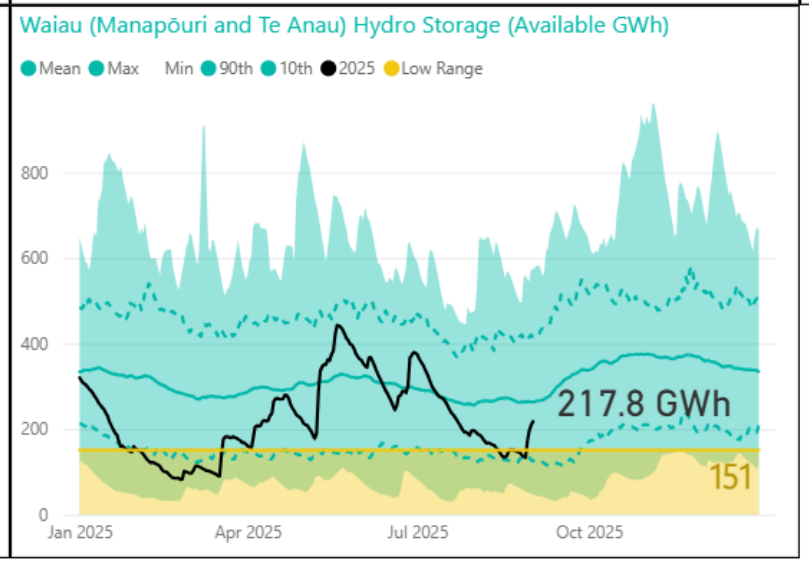
Hydro storage by catchment







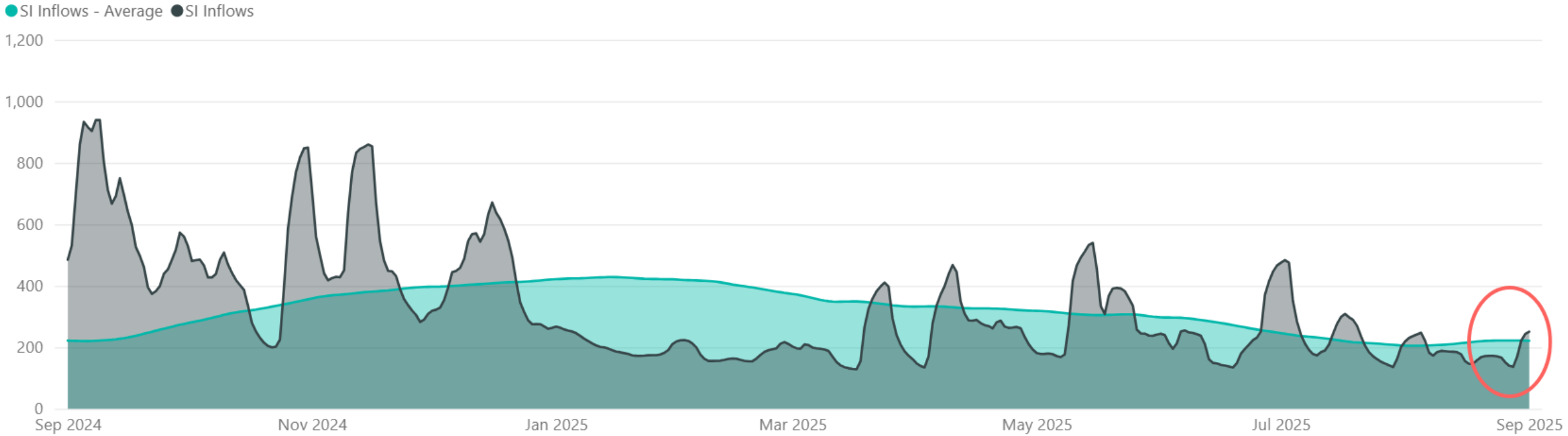




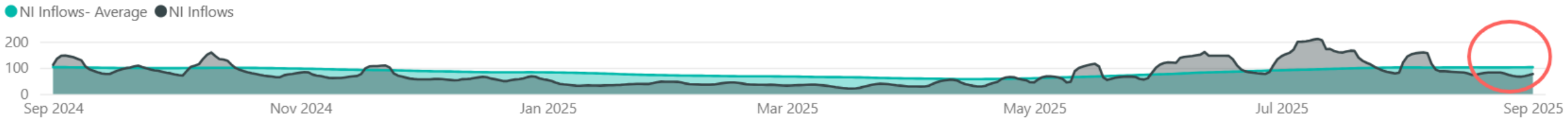
Lake	Current (%) avg
nz_controlled	77
si_controlled	73
hawea	53
pukaki	79
manapouri	107
te_anau	70
tekapo	55
taupo	105

Hydro inflows

South Island Mean 7 Day Inflows (Available GWh)



North Island Mean 7 Day Inflows (Available GWh)



August ERCs & SSTs

Changes this update:

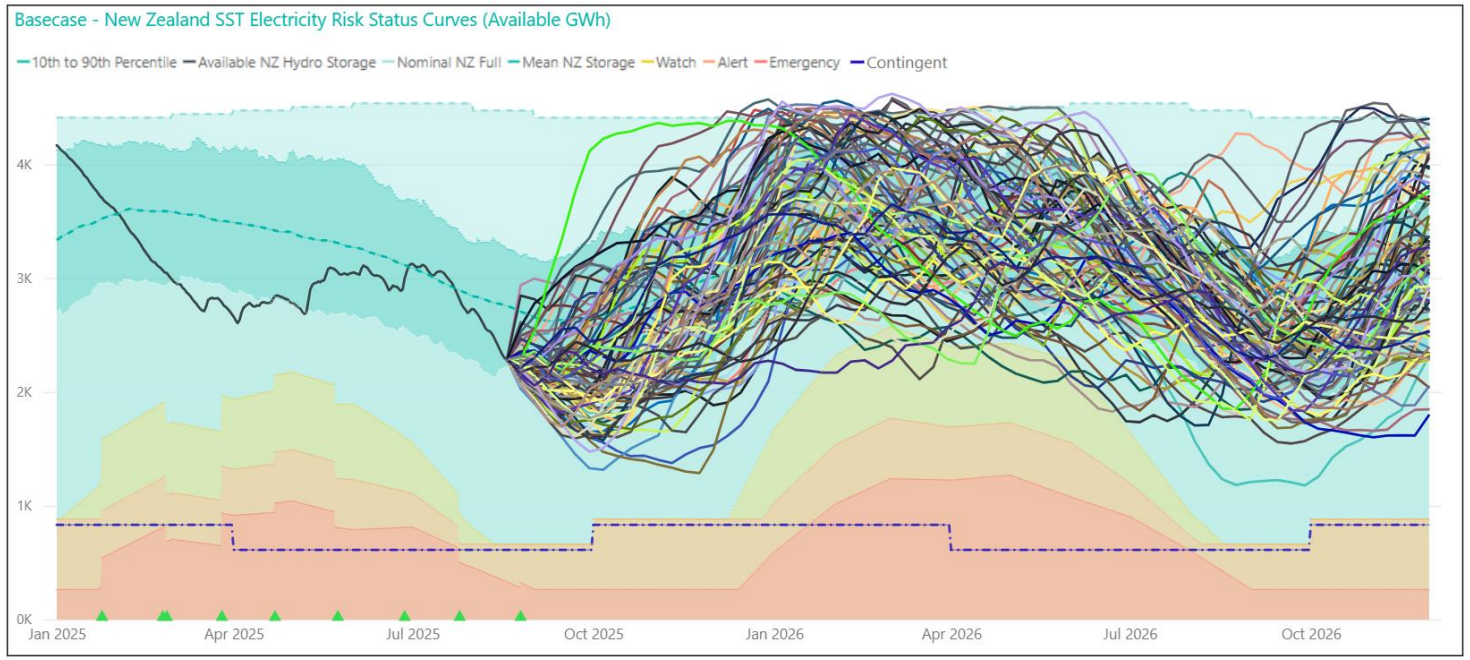
- Decreased forecast gas production
- Updated outages and commissioning dates

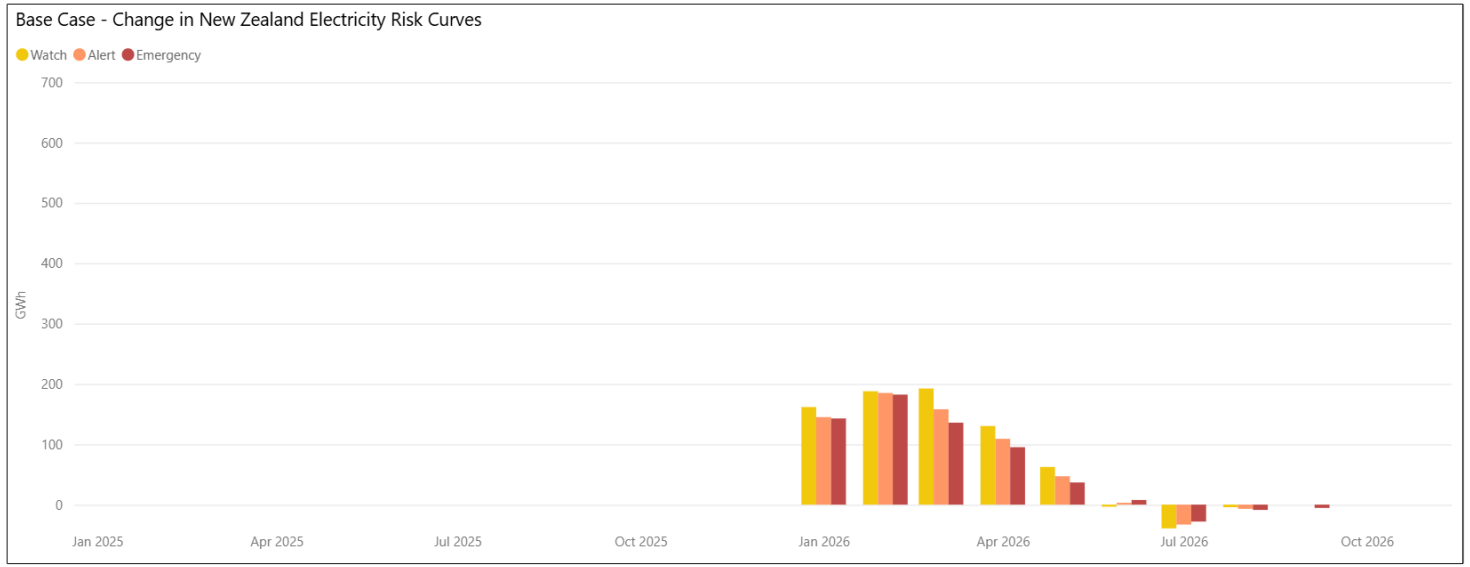
SSTs (93 total) crossing NZ:

	Watch	Alert	Emergency
2025	0	0	0
2026	8	0	0

Increases of up to:

- 190 GWh Watch (March 2026)
- 180 GWh Emergency (February 2026)





August ERCs & SSTs

Scenario – Rankine remains 2026

- This scenario assumes the third Rankine unit will be available and that coal is imported at the maximum physical import capability

Major changes (relative to base case):

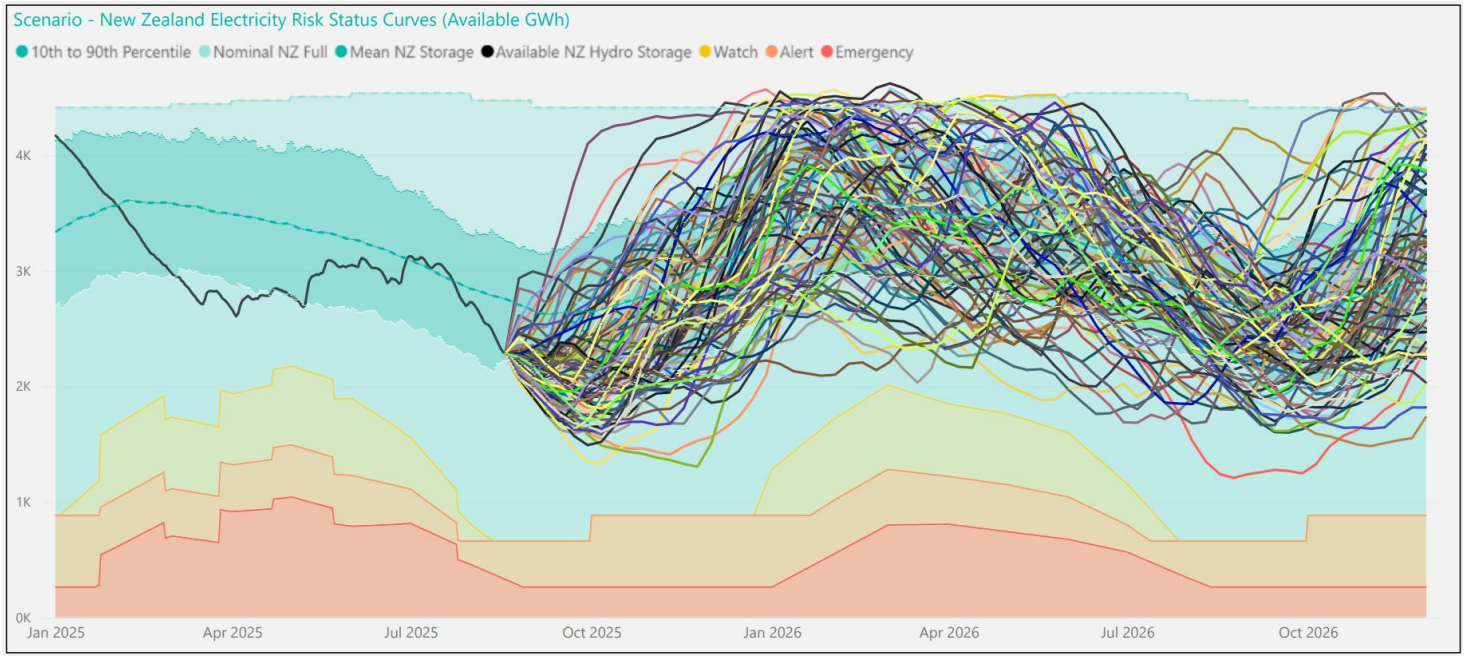
- Decreased Watch, Alert and Emergency curves in 2026
- No SSTs cross any of the curves in 2025 or 2026

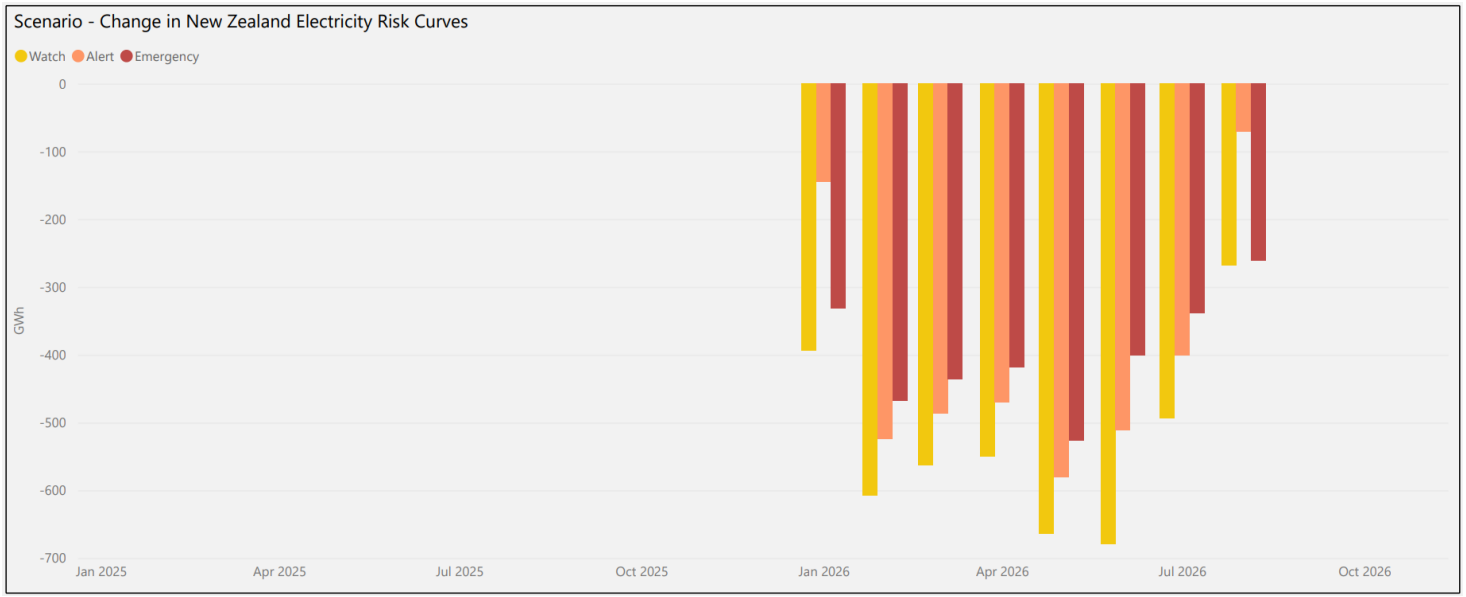
SSTs (93 total) crossing NZ:

	Watch	Alert	Emergency
2025	0	0	0
2026	0	0	0

Decreases of up to:

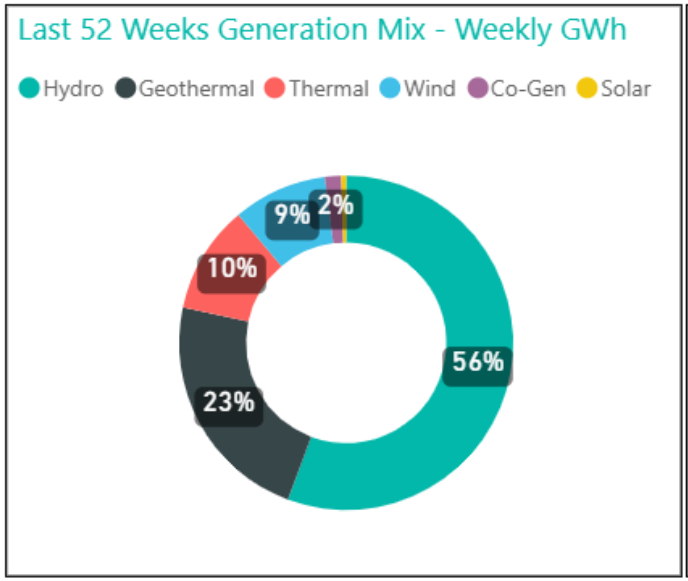
- 680 GWh Watch (June 2026)
- 530 GWh Emergency (May 2026)

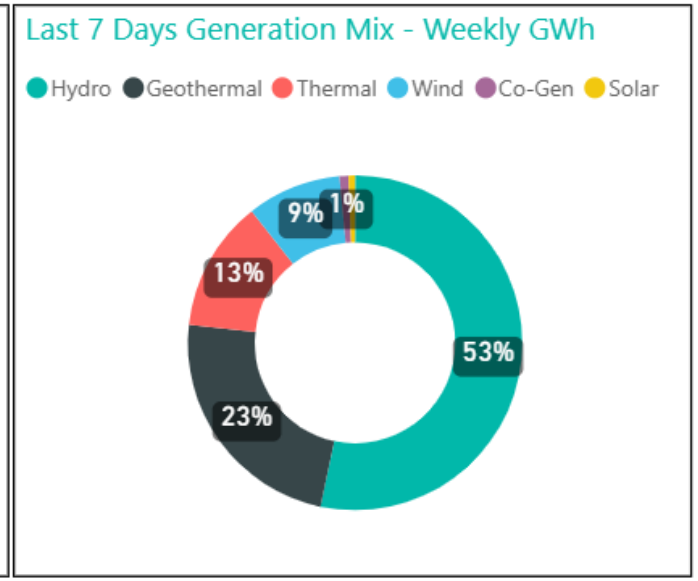


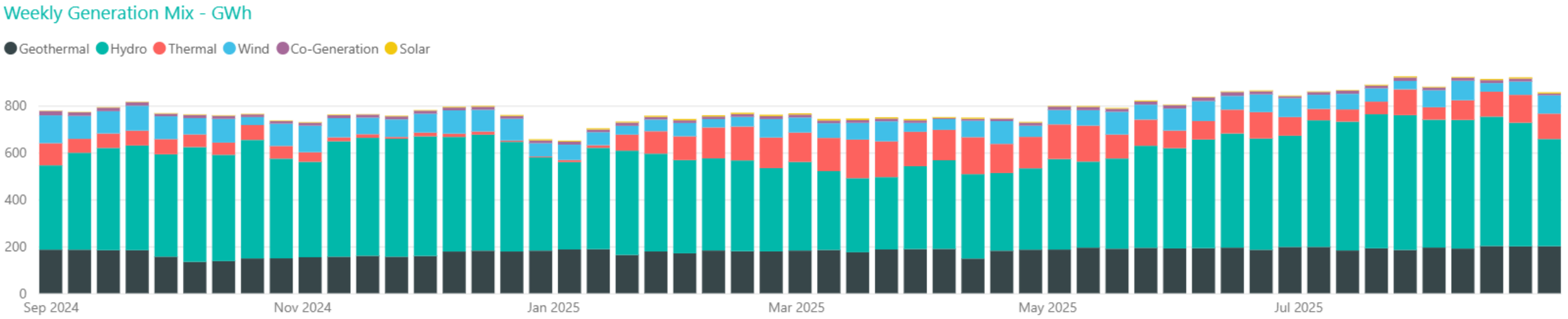


Generation mix

- The hydro generation share dropped below the 52-week average, for the first time since May, at 53%.
- The thermal generation share remains above average at 13%.
- Wind and geothermal were both average, at 9% and 23% respectively.

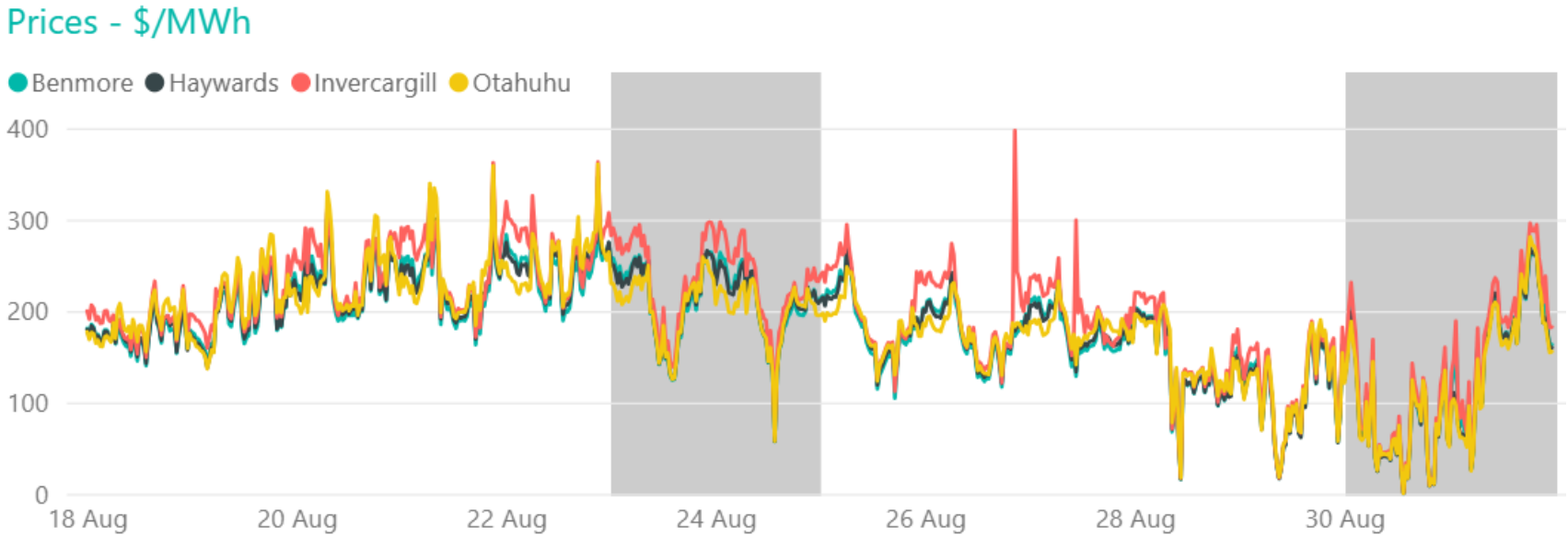


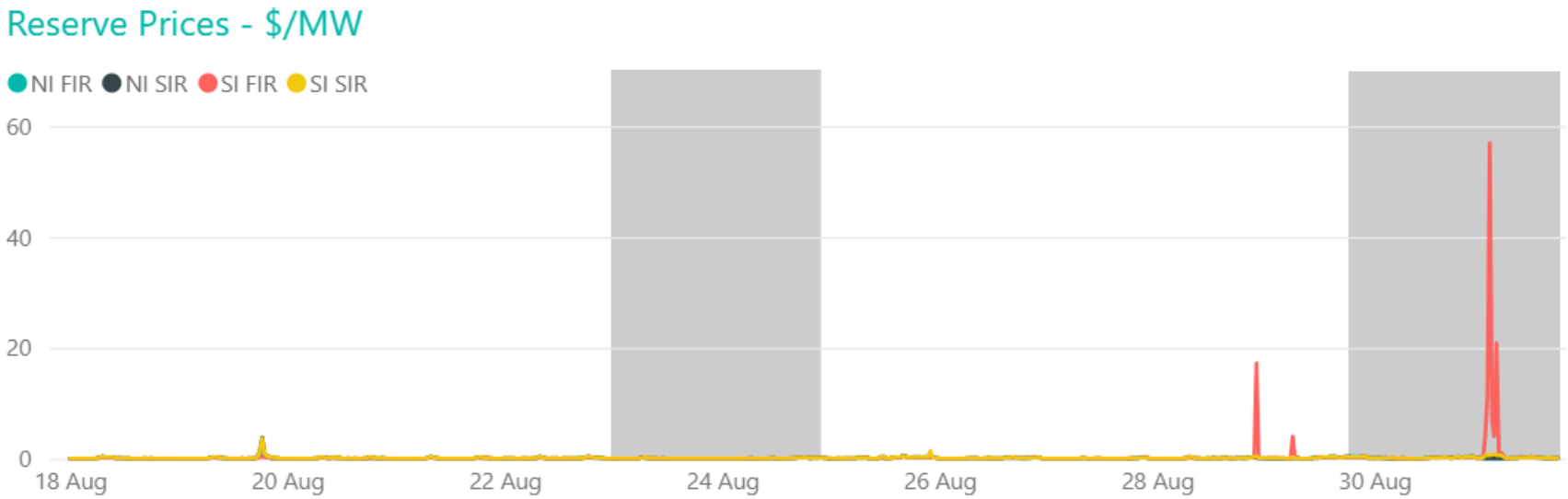




Pricing

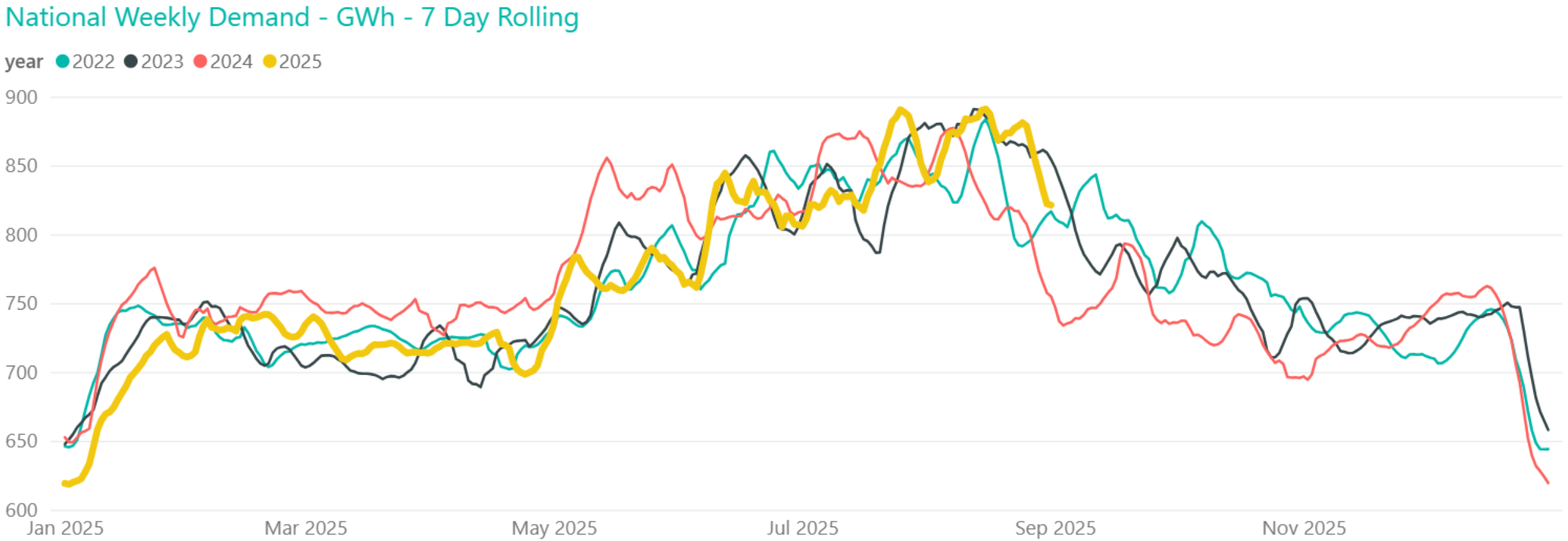
- Average Ōtāhuhu price was $148/MWh last week, and $218/MWh the week prior.
- Wholesale prices peaked at $398/MWh at Invercargill at 8:30 pm on 26 August, due to a grid constraint.
- SI FIR prices peaked at $57 at 1:30 am on 31 with the HVDC setting the risk during high south flow.





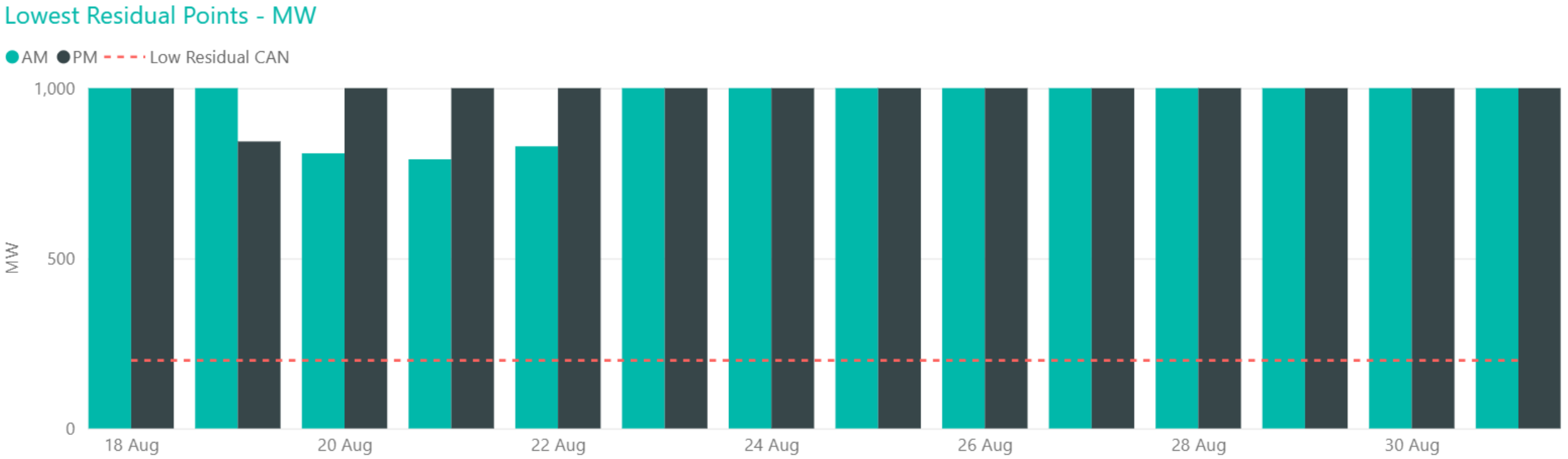
Demand

- Demand dropped significantly last week from the previous week, with a switch from colder than usual to warmer than usual weather.
- 821 GWh last week, down from 881 GWh the week prior.



Capacity residual margins

- High residual margins (lowest 790 MW).
- TCC has been running, which has helped keep residuals high.



Karapiro Special Protection Scheme update

Karapiro (KPO) Circuit Overload Protection Scheme (COPS)

The scheme reduces KPO generation in response to an overload on any one of the following 110kV circuits out of KPO:

- Karapiro-Te Awamutu 1 (KPO-TMU-1)
- Hamilton-Cambridge-Karapiro 1 (HAM-CBG-KPO-1)
- Hamilton-Cambridge-Karapiro 2 (HAM-CBG-KPO-2

	N-1	N-1-1	N-2 (SPS not in use)
Without SPS	KPO generation restricted	KPO generation restricted	KPO generation restricted
With SPS	Max KPO generation	Max KPO generation	KPO generation restricted

N-1: Everything in service and one tripping
N-1-1: One outage and one tripping
N-2: Two trippings

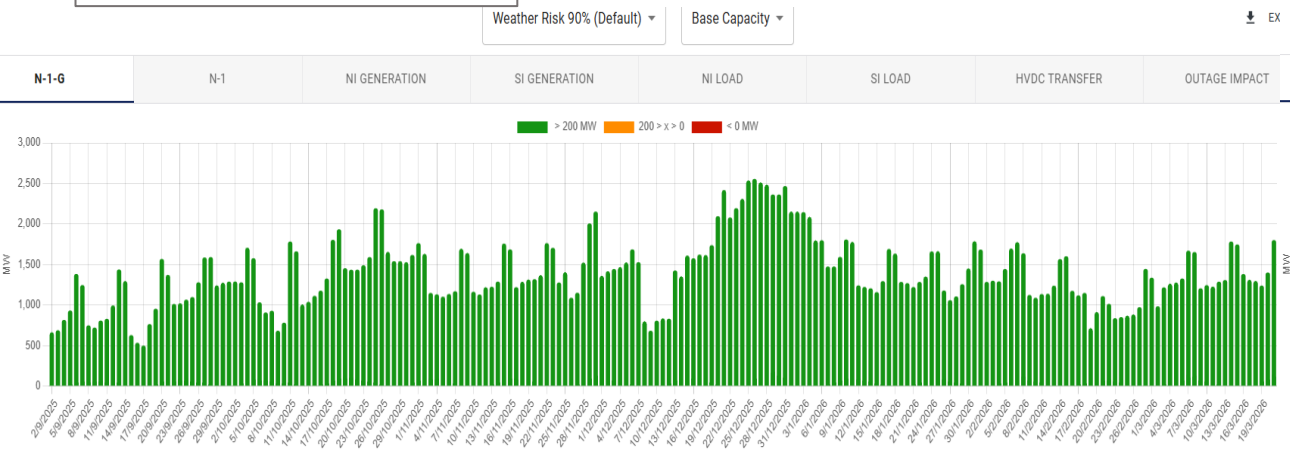
The scheme allows more generation from KPO to be exported to the grid pre-contingently.

NZGB update

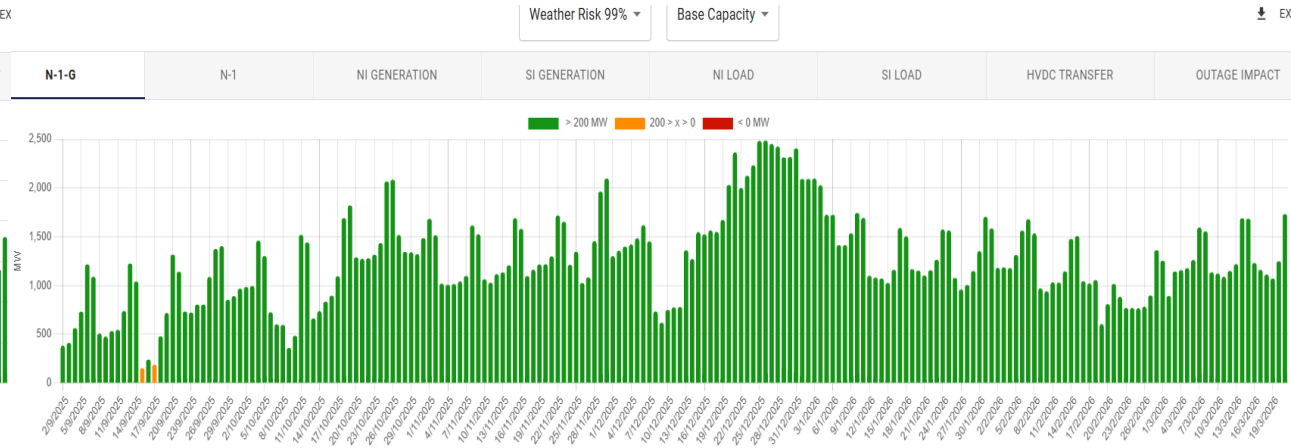
NZGB update: base capacity N-1-G

- N-1-G margins are currently showing healthy values
- Under the 99th percentile load, which we would expect under a cold snap, the margins drop

Base case capacity at 90%
- ***This triggers the CAN process***
- Assumes all generation available in POCP is offered
- It uses 20% of total wind capacity



90th percentile load



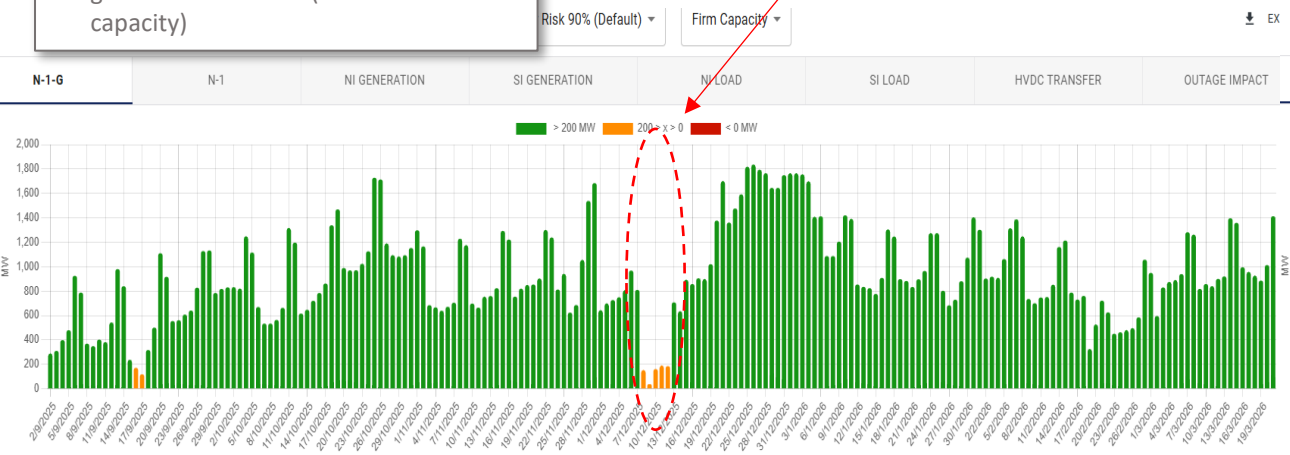
99th percentile load

NZGB update: firm capacity only N-1-G

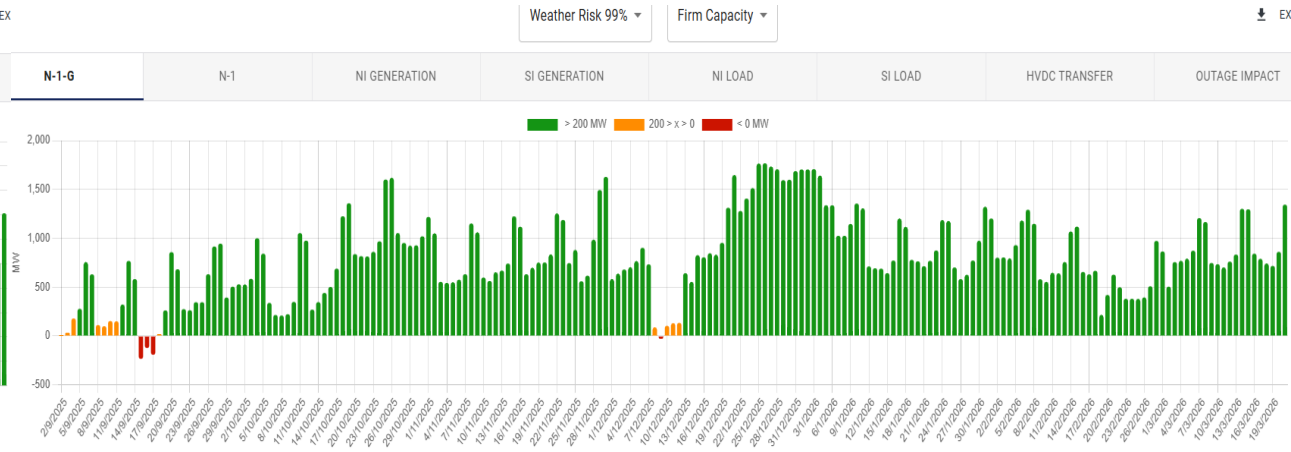
- Firm capacity scenario reflects units that historically operate for at least 90% of AM & PM peaks
- The potential shortfalls and low margin periods highlight the potential reliance on these units to be available to cover N-1-G
- This means we are relying on the market to coordinate especially slow starting thermal units, to get through high peak load periods

Firm capacity removes
- TCC (-360MW) all months,
- 1 HLY Rankine over winter months June to November, and 2 Rankines over the remaining months
- It uses the lowest 10th percentile generation for wind (8% of total capacity)

WKM-WRK-1 outage



90th percentile load



99th percentile load

NZGB update: Information

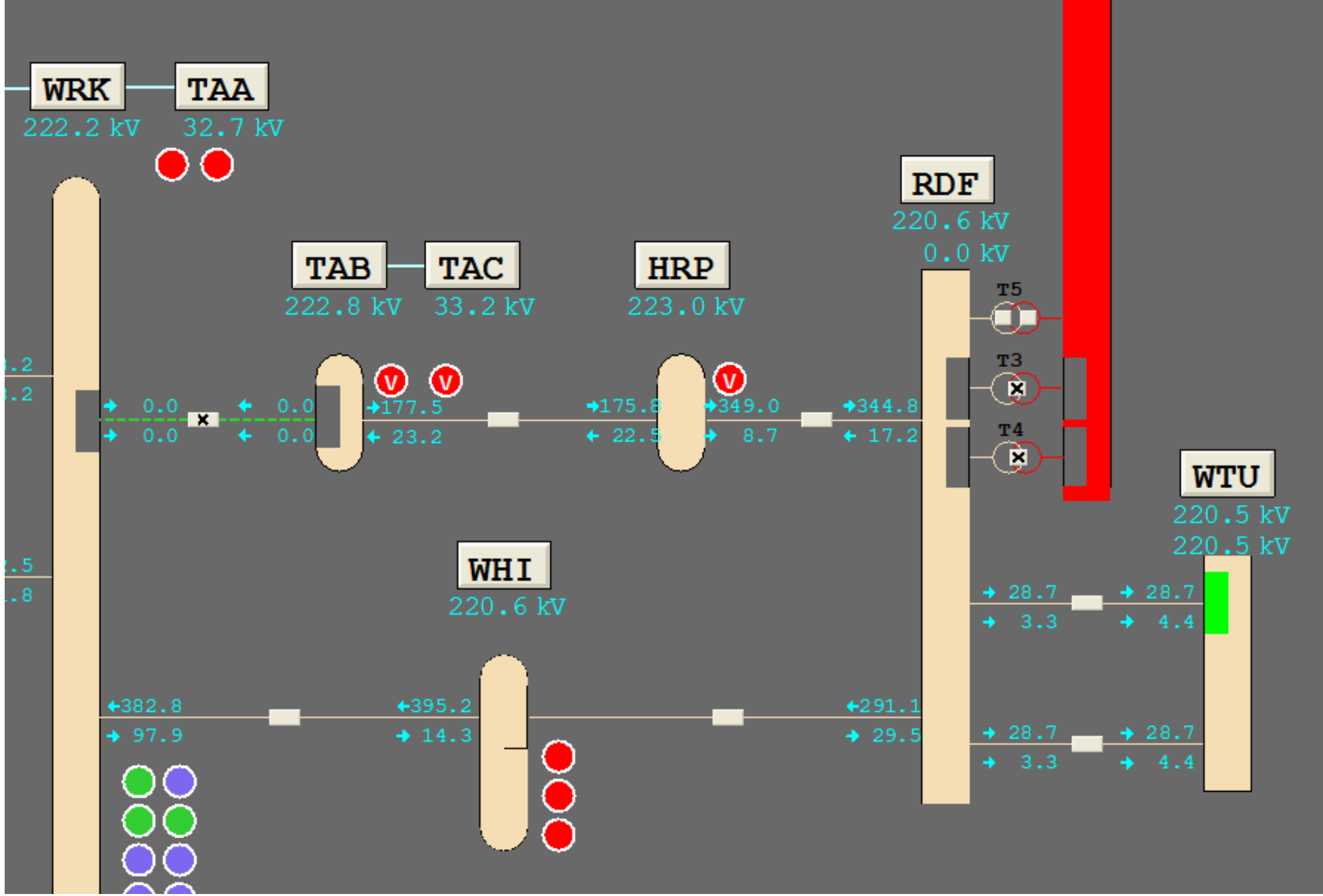
Recommendations from SO:

- Avoid further outages during periods with low margins
- Market coordination is required from industry to ensure available generation capacity remains high to cover potential cold snaps
- Keep POCP updated with scheduled or tentative outages
- Keep the WDS up to date with the latest offers
- Any other information on plant availability, please get in touch with SO

Operational update

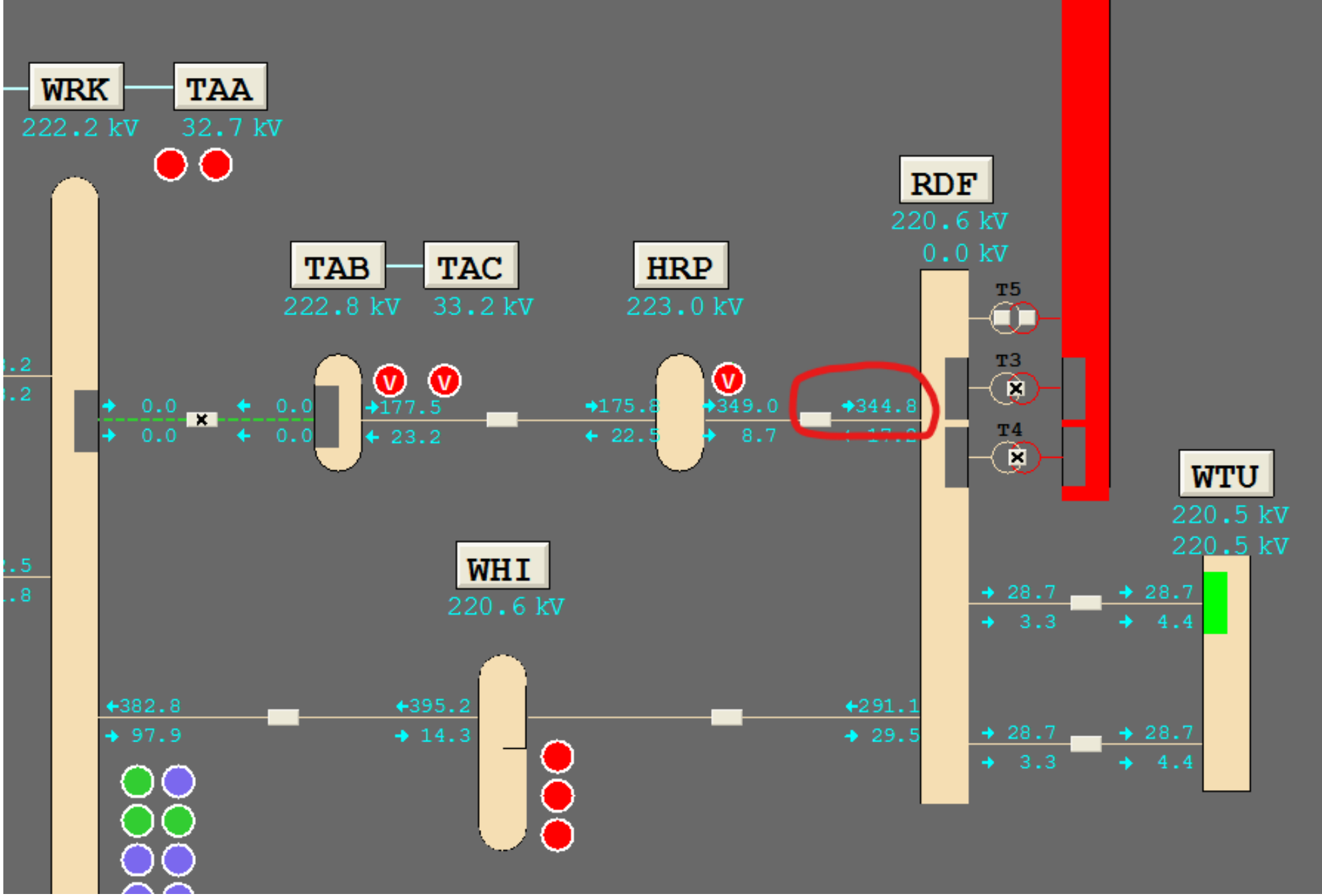
Operations Update

Managing under frequency risk during transmission circuit outages



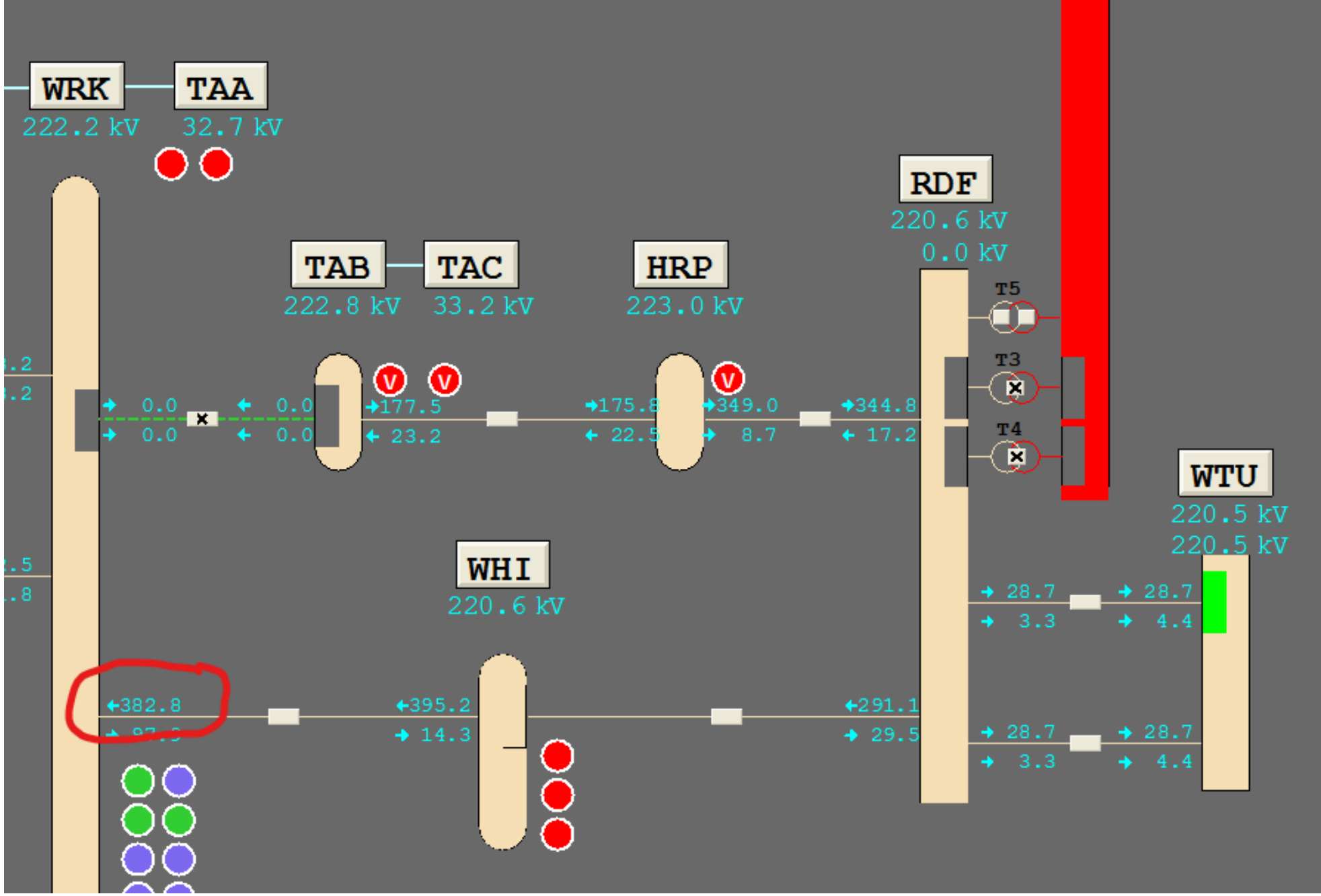
Operations Update

Simple risk group
Add the output of all generators together (TAB, TAC and HRP) to identify the risk



Operations Update

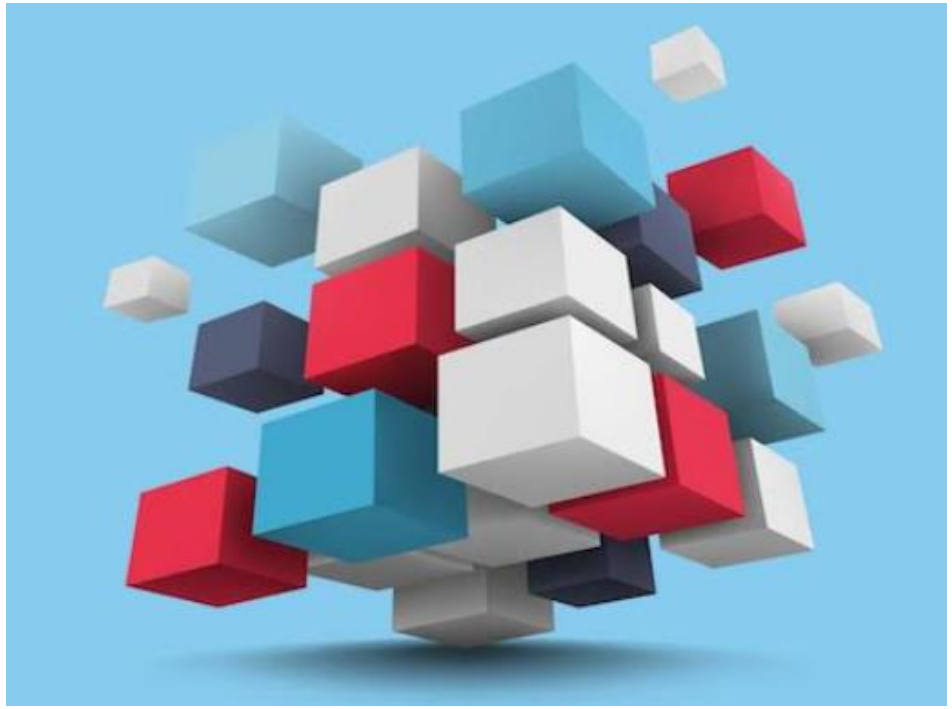
Set WHI_WRK circuit as Under frequency risk
Complex risk group
Add the output of all generators together (TAB, TAC, HRP, WKA and WHI) – local load (RDF, FHL, WTU, TUI and WHI) to identify the risk to North Island



Operations Update

Disaggregation of IL providers where regional export can set the Island CE risk

- Hawkes Bay
- Kawerau



CACTIS Consultation

Consultation Open: Proposed Connecting Asset Commissioning Testing and Information Standard (CACTIS)

- Part of Authority's Future System Resilience Programme
- Based on Technical Codes A and C
- Revised technical requirements for asset owners

CACTIS covers:

1. Timeframes
2. Commissioning Plans
3. Asset Capability Statements
4. Modelling
5. Connection Studies
6. Test Plans
7. Testing
8. Operational Communications
9. High Speed Data

Consultation Open: Proposed Connecting Asset Commissioning Testing and Information Standard (CACTIS)

- Supports system security
- Improves consistency and enforceability
- Leads to more responsive Code updates
- Accelerates integration of new technologies
- Aligns with industry trends

We welcome your feedback!

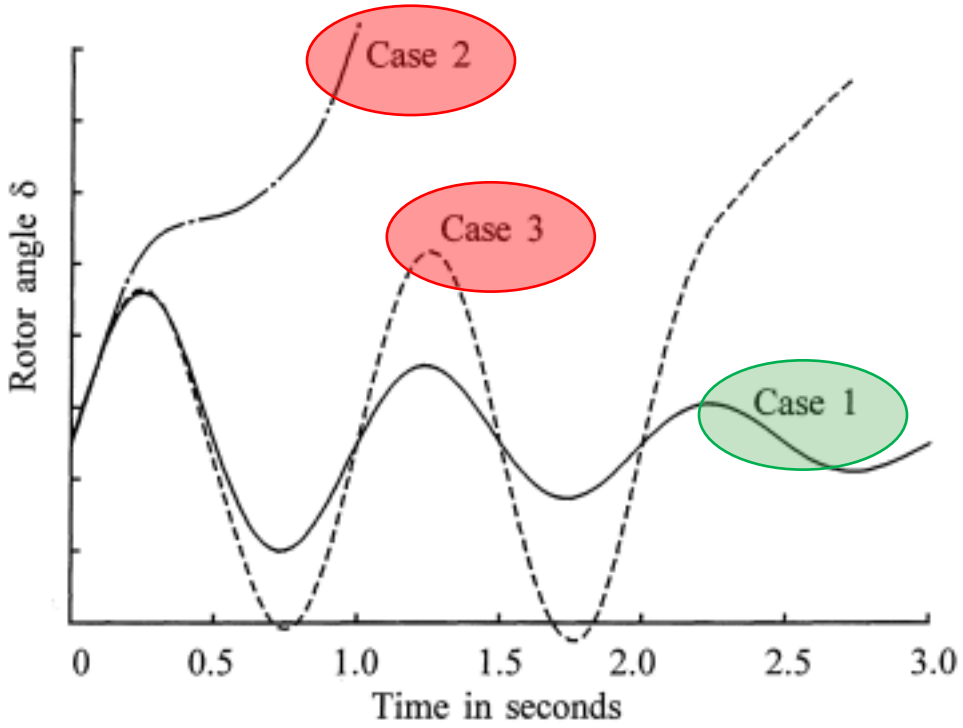
See the System Operator Consultations webpage.

Closing date: 5pm, Monday 29 September 2025

Transient Rotor Angle Stability Update-2025

Transient Rotor Angle Stability (TRAS)

Transient rotor angle stability is a synchronous machine's ability to remain synchronised under normal operating conditions and to regain synchronism after a disturbance.



The purpose is to:

- Determine if the New Zealand power system can maintain synchronism when subjected to large disturbances.
- Identify critical faults or contingencies that could lead to instability, or near instability
- Propose measures to enhance stability or manage the risks of instability.

Additional Transient Rotor Angle Stability Studies

TRAS 2024 Recap 🕒

North Island

220 kV faults ✅

110 kV faults ⚠️

South Island

220 kV faults ⚠️

110 kV faults ✅

Key Focus Areas 🎯

- Impact of future committed projects from 2025-2027
- Influence of Inverter-based resources
- Impact of updated Ngawha B generator model

Key Assumptions

- Transient Security Assessment Tool **(TSAT)**
- We used purpose built TSAT models

Study Findings

North Island

- Tauhara B & Te Huka C potential instabilities under low voltage
- Updated Ngawha model improves the situation but Kaikohe 110 kV faults remain unstable
- All other potential stabilities status remain same for 110 kV faults

South Island

- Manapouri instability remained same.
- Kaiwera Downs Stage 2 impacts Manapouri stability for 220 kV faults

Next Steps

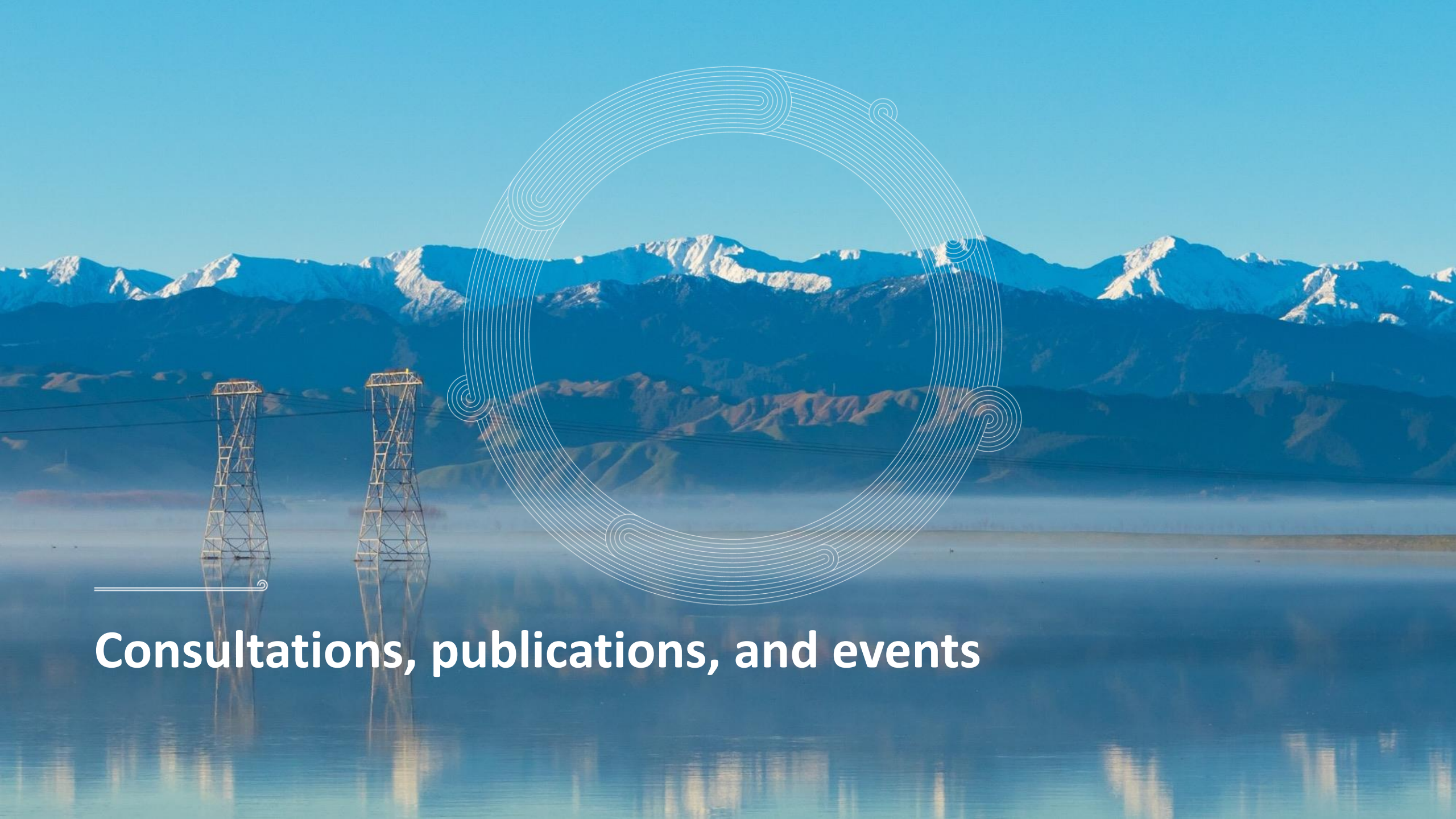
Operational measures to mitigate the risk

- Monitor Transient Rotor Angle Stability limits in real time
- Apply stability constraints
- Apply voltage adjustments

Asset Owners should consider pole-slip protection

SSF report
https://www.transpower.co.nz/system-operator/planning-future/system-security-forecast

For any queries
Power_Systems_Engineering@transpower.co.nz



Consultations, publications, and events

Consultations, publications, and events

The **CACTIS consultation** is open, submissions are due by 5pm on 29 September.

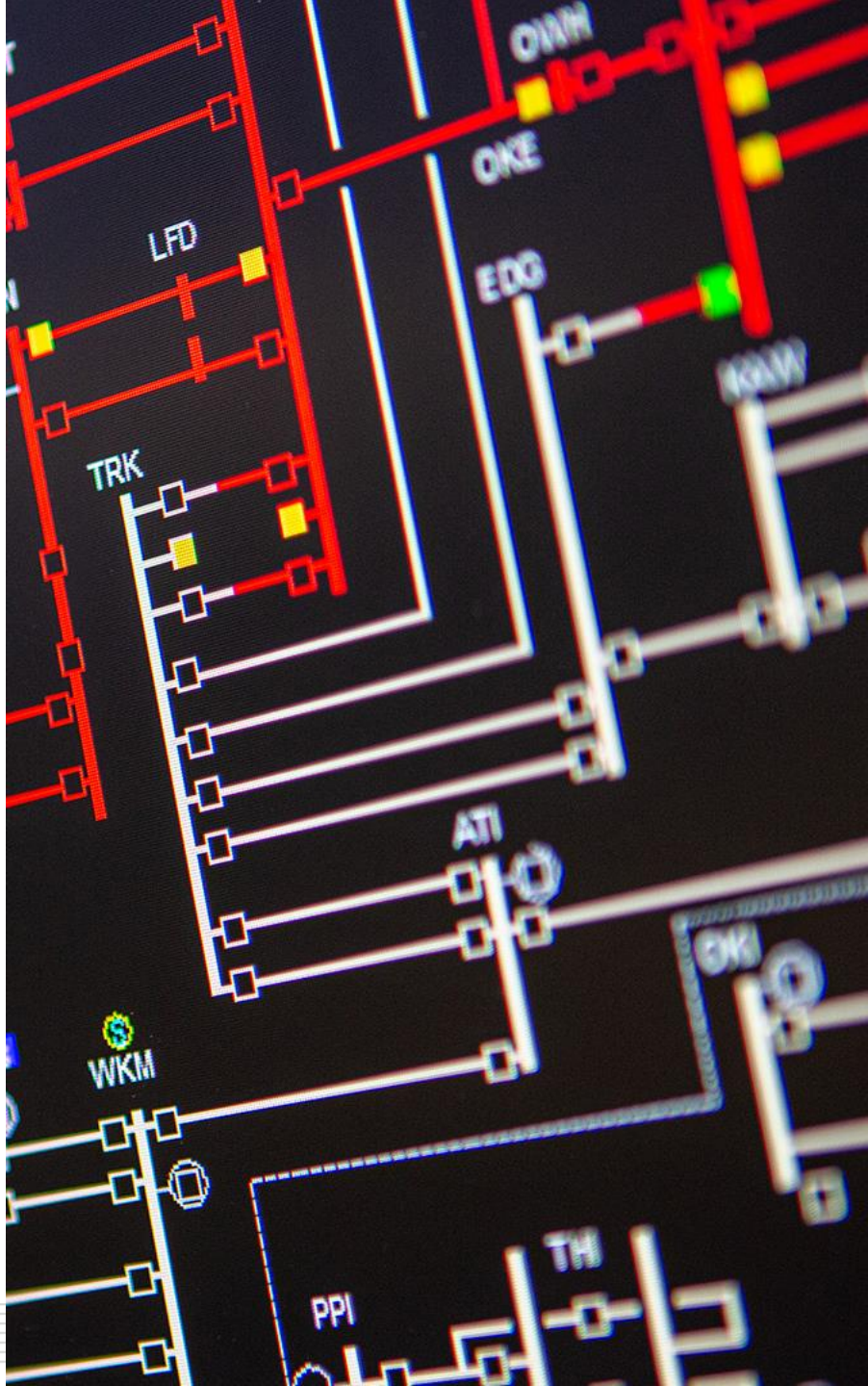
Thanks to those who submitted to our **Tie breaker provisions** consultation, the 7 submissions and 2 cross submissions are available on our website. We are now preparing our summary and response.

Last week we published the **August Energy Security Outlook** which is available on our website.

We completed our consideration of feedback from recent Credible Event Review consultations and have:

- published an updated version of our review into **Generating unit risk when connecting in groups**.
- determined to maintain our existing method of modelling **HVDC cable discharge**, details are available on our website.

Our **Monthly System Operator Performance Report** for July has been published on the Authority's website.



Any questions
Please raise your hand